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North Carolina Department of Transportation
Statewide Planning Branch

URBAN AREA THOROUGHFARE PLAN
for
NEW BERN TRENT WOODS BRIDGETON RIVER BEND

OCTOBER 1993

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THE

NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND

THOROUGHFARE PLAN

Prepared by the:
Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

In Cooperation with:
The City of New Bern
The Town of Bridgeton
The Town of Trent Woods
The Town of River Bend
The County of Craven
The Federal Highway Administration
U.S. Department of Transportation

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I. INTRODUCTION

Transportation system efficiency, today more than ever, plays a vital role in our economy and way of life. It is used every day by the business, industrial, and residential sectors. To insure that individual road projects eventually form a cohesive, coordinated system, a **thoroughfare plan** is developed.

Recognizing the importance of such a system, the New Bern area has planned transportation improvements for many years. In 1964 a Thoroughfare Plan was cooperatively developed and mutually adopted by the City of New Bern, the Town of Bridgeton, and the North Carolina Highway Commission. Several major projects that were included in that plan have been constructed. They are as follows:

1. Widening of First Street and extending it to the US 70 Bypass.
2. Widening Neuse Boulevard to four lanes.
3. Extending Simmons Street to Oaks Road.
4. Construction of the US 70 Bypass.
5. Extension of Glenburnie Road to Race Track Road.

In 1978 a major update of the 1964 plan was completed and mutually adopted by the City of New Bern, the Town of Bridgeton, the Town of Trent Woods, and the North Carolina Department of Transportation. Two major recommendations from that plan have subsequently been constructed. They are:

1. The extension of Williams Road from Howell Road to US 70.
2. Widening of Glenburnie Road from US 70 Bypass to US 17.

There are several projects that are currently scheduled for construction in the North Carolina Department of Transportation's Improvement Program (TIP). They are:

1. US 17 New Bern Bypass.
2. Widen NC 55 in Bridgeton to multilanes.
3. Widen US 17 in New Bern from Trent Road to Neuse Boulevard.
4. Replace and improve the Neuse and Trent River Bridges in New Bern.

The purpose of this study is to re-examine the 1978 plan as it relates to the present and future transportation needs of the New Bern-Bridgeton-Trent Woods-River Bend area, and from this derive a revised Thoroughfare Plan that can be mutually endorsed by the participating municipalities, Craven County, and the Department of Transportation.

The system of thoroughfares proposed in this study was developed following the principles of thoroughfare planning outlined in Chapter II of this report. The recommended cross-sections are based on existing conditions and the expected volume of traffic in the design year (2015). Every effort was made to use as much of the existing street system as possible in order to minimize cost and environmental disruption. Location of new facilities was based on field investigation, existing land use, and topographic conditions. However, the locations are only preliminary, and a more detailed evaluation will be necessary before a project can be constructed.

Initiative for plan implementation will rest largely with the policy boards and citizens of the area. The scope of highway needs throughout the State greatly outweigh the available funding. It is, therefore, necessary that the local areas aggressively pursue funding for desired projects.

Responsibility for the proposed construction must be shared by New Bern, Bridgeton, Trent Woods, River Bend, and the North Carolina Department of Transportation. With the multitude of governmental agencies involved in providing the elements of the plan, coordination of activities is of prime importance. The plan should be formally adopted by all the local governing bodies and the North Carolina Board of Transportation, to serve as a mutual official guide in providing a well coordinated, adequate, and economical major street system. In order for the plan to be effective, the municipalities and the State must procure in advance or protect by various legal controls the right-of-ways necessary for the improvements which will ultimately be required.

It must be emphasized that the Thoroughfare Plan was based on anticipated growth of the urban area, as provided by the participating municipalities and Craven County. Actual growth rates and patterns may differ from those anticipated and it may become necessary to accelerate or retard the development of thoroughfares or to make revisions in the proposed plan. It is desirable to review the plan in detail approximately every ten to fifteen years to adjust the thoroughfare system to the actual growth and type of development.

II THOROUGHFARE PLANNING PRINCIPLES

Basic Principles

The urban street system typically occupies 25 to 30 percent of the total developed land in the urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process used by public officials to assure the development of the most logical and appropriate street system to meet future travel desires. The major steps involved in the thoroughfare planning process are:

1. *Collection of data* concerning existing physical development and travel desires within the area.
2. *Development of a (computer) model* which reflects present travel desires.
3. *Prediction of future socioeconomic data*, and computation of future travel desires using the computer model.
4. *Evaluation* of the adequacy of the existing street system in serving present and future travel.
5. *Formulation of the best thoroughfare plan*, on the basis of travel demand, economic benefits, and environmental considerations, to meet future travel desires.
6. *Development of construction priorities* for plan implementation.
7. *Implementation* of the plan.

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to assure that the street system will be progressively developed in such a manner as to adequately serve future travel desires. Thus, the cardinal concept of thoroughfare planning is that provisions be made for street and highway improvements so that as needs arise, feasible opportunities to make improvements exist.

Some of the benefits derived from thoroughfare planning are: (1) Each street can be designed to perform a specific function. This permits savings in right-of-way and construction costs; and encourages stability in travel and land use patterns. (2) Local officials and citizens are informed as to future improvements. Public facilities can be better located; and damage to property and appearance can be minimized (for example: buildings and plants can be located to permit future street widening). (3) Residents will know which streets will be developed as major thoroughfares and be able to make an informed decision when choosing a home. (4) City officials will know when improvements will be needed and can schedule funds accordingly.

Efficiency

The improvement of the efficiency of existing facilities can be achieved through: (1) improving the **system efficiency**; and (2) improving the **operational efficiency** of thoroughfares.

(1) System Efficiency - A more efficient system can reduce travel distances, time, and cost. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Functional Classification - Streets perform two primary functions - they provide **traffic service** and **land service.** *These two functions are basically incompatible.* The conflict is not serious if both traffic and land service demands are low, but when traffic volumes are high, conflicts created by intense land service demands result in intolerable congestion.

The Thoroughfare Plan provides a functional system of streets which permits travel with directness, ease, and safety. Different streets in the system are designed to perform specific functions thus minimizing the traffic and land service conflict. Streets can be functionally categorized as: local access streets, minor thoroughfares or as major thoroughfares.

"Local Access Streets" provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins or destinations on the streets would be served. *THEIR FUNCTION IS TO PROVIDE ACCESS.* Depending upon the type of land use which they serve, local access streets may be further classified as residential, commercial, and/or industrial.

"Minor Thoroughfares" are more important streets in the city system. They collect traffic from local access streets and carry it to the major thoroughfare system. They may, in some instances, supplement the major thoroughfare system by aiding minor through movements. A third function which may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

"Major Thoroughfares" are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. Although undesirable, the streets which comprise the major thoroughfare system may also serve abutting property; however, *THEIR MAJOR FUNCTION IS TO CARRY TRAFFIC.* They should not be bordered by strip development because such development significantly lowers the capacity of the thoroughfare, and each driveway is a danger to traffic flow. Major thoroughfares may range from two lane streets to expressways with six or more traffic lanes. As a general rule, parking should not be permitted on major thoroughfares.

Figure 1 graphically illustrates the trade-off between the travel service and land service functions of the above types of facilities.

(2) Operational Efficiency - A street's operational efficiency is improved by increasing the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, a street's **capacity** is defined as "the maximum number of vehicles which can pass a given point on a roadway during a given time period under prevailing roadway and traffic conditions." Capacity is affected by the physical features of the roadway, nature of traffic, and weather.

Physical ways to improve vehicular capacity include street widening, intersection improvements, improving the vertical and horizontal alignment, eliminating road-side parking and eliminating property access points.

Operational ways to improve street capacity include:

(1) **Control of access** - A roadway with complete access control can carry over two times the traffic handled by a non-controlled access street.

(2) **Parking removal** - Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking operations.

(3) **One-way operation** - The capacity of a street can be increased 50% or more, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.

(4) **Reversible lanes** - Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.

(5) **Signal phasing and coordination** - Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

(1) Encourage people to form carpools and vanpools for work and other trips. This reduces the number of vehicles on the roadway while increasing the people carrying capability of the street system.

(2) Encourage the use of mass transit, bicycles, and pedestrian travel.

(3) Encourage industries and business to stagger work hours or establish variable work hours for employees. This will reduce travel demand in peak periods and spread peak travel over a longer time period.

Idealized Thoroughfare Plan System

A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is most adaptable to desired lines of travel within an urban area and which permits movement between various areas of the city within maximum directness is the radial-loop system. This system consists of several functional elements--radial streets, crosstown streets, loop system streets, and bypasses.

Radial streets provide for traffic movement between points located on the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of crosstown streets which form a loop around the central business district. This system allows traffic moving from origins on one side of the central area to destinations on the other to follow the area's border and allows central area traffic to circle and then enter the area near a given destination. The effect of a good crosstown system is to free the central area of crosstown traffic, thus permitting the central area to function more adequately in its role as a pedestrian shopping area.

Loop system streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area, and they are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A bypass is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing from it traffic which has no desire to be in the city. Bypasses are usually designed to through-highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

An idealized thoroughfare plan showing the described facilities is in Figure 1.

Application of Thoroughfare Planning Principles

The above descriptions are of an idealized major thoroughfare system. In actual practice, thoroughfare planning is done for established areas and is constrained by existing land use and street patterns, public attitudes, and expectations of future land use. Compromises must be made because of these, and other factors that may affect major street locations.

IDEALIZED THOROUGHFARE PLAN

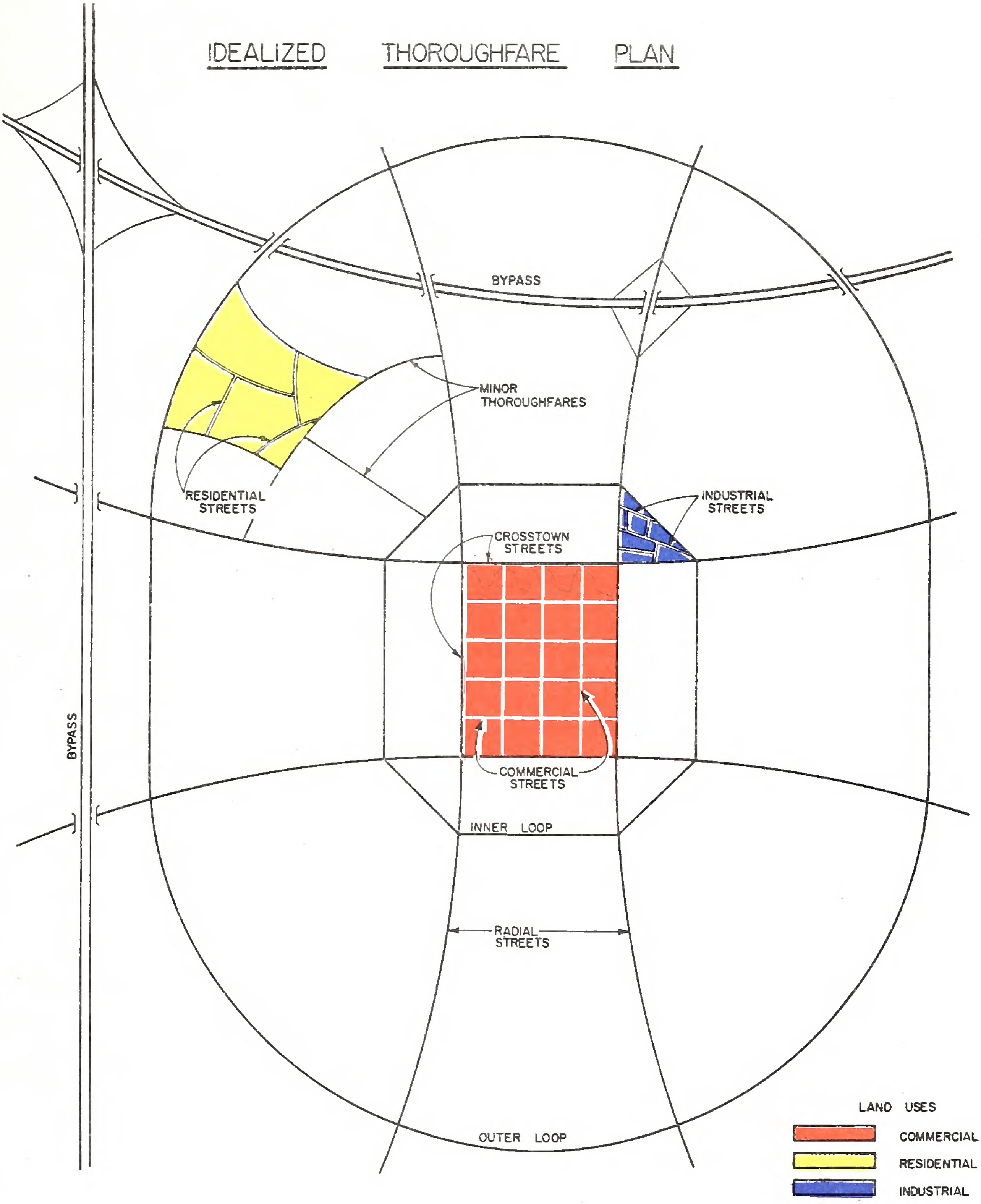


FIGURE 1

III. EXISTING AND PROJECTED CONDITIONS

The planning area under study that includes New Bern, Bridgeton, Trent Woods, and River Bend is located in Craven County, which is situated in the central coastal region of North Carolina at the confluence of the Neuse and Trent Rivers (Figure 2). The topography of the area varies from flat to gently rolling. The average elevation is sixteen feet above sea level.

The City of New Bern, founded by German and Swiss settlers in 1710, is the largest municipality in the planning area, and it is the county seat. It also holds the distinction of being the first colonial and state capital of North Carolina.

The Town of Bridgeton is located directly across the Neuse River from New Bern, and it is named for the bridge that joins the two municipalities. It was settled in 1900 and incorporated in 1907.

In 1922 the New Bern Golf and Country Club was constructed approximately two miles west of New Bern along the Trent River. In the middle 1950's the area experienced tremendous growth. Desiring to be responsible for their own governmental management the residents living in proximity to the golf course incorporated, and in 1959 the Town of Trent Woods was formed.

River Bend Plantation was started in 1966 on 1200 acres of prime land approximately five miles west of New Bern on US 17, along the Trent River. Gradually, pressures of being in one of the fastest growing Townships in Craven County and of being in the long range annexation path of New Bern stimulated the community to incorporate. In January of 1981, this planned development of 1057 people became the Town of River Bend.

The planning area is accessed by a diverse transportation system. The major highway network is composed of (1) US 70 Bypass which is a four-lane freeway that serves as and important link to the mid-state population centers and the coast (2) US 17 going through the area is the only designated highway route east of I-95 that extends from South Carolina to Virginia (3) NC 55 and NC 43 are important inter-county connectors. While there is no passenger rail service to the area, Southern Railway does offer freight rail service. The Craven County Regional Airport (Simmons-Nott Airport) serves as the regional airport for a five county region. It serves both a commercial and general aviation function. The Neuse and Trent Rivers provide docking facilities for commercial shipping and recreational boating.

Craven County like many rural North Carolina counties is experiencing a diversification in its economy, with traditional agriculture base giving way to manufacturing and service related industries.

GEOGRAPHIC LOCATION

NEW BERN

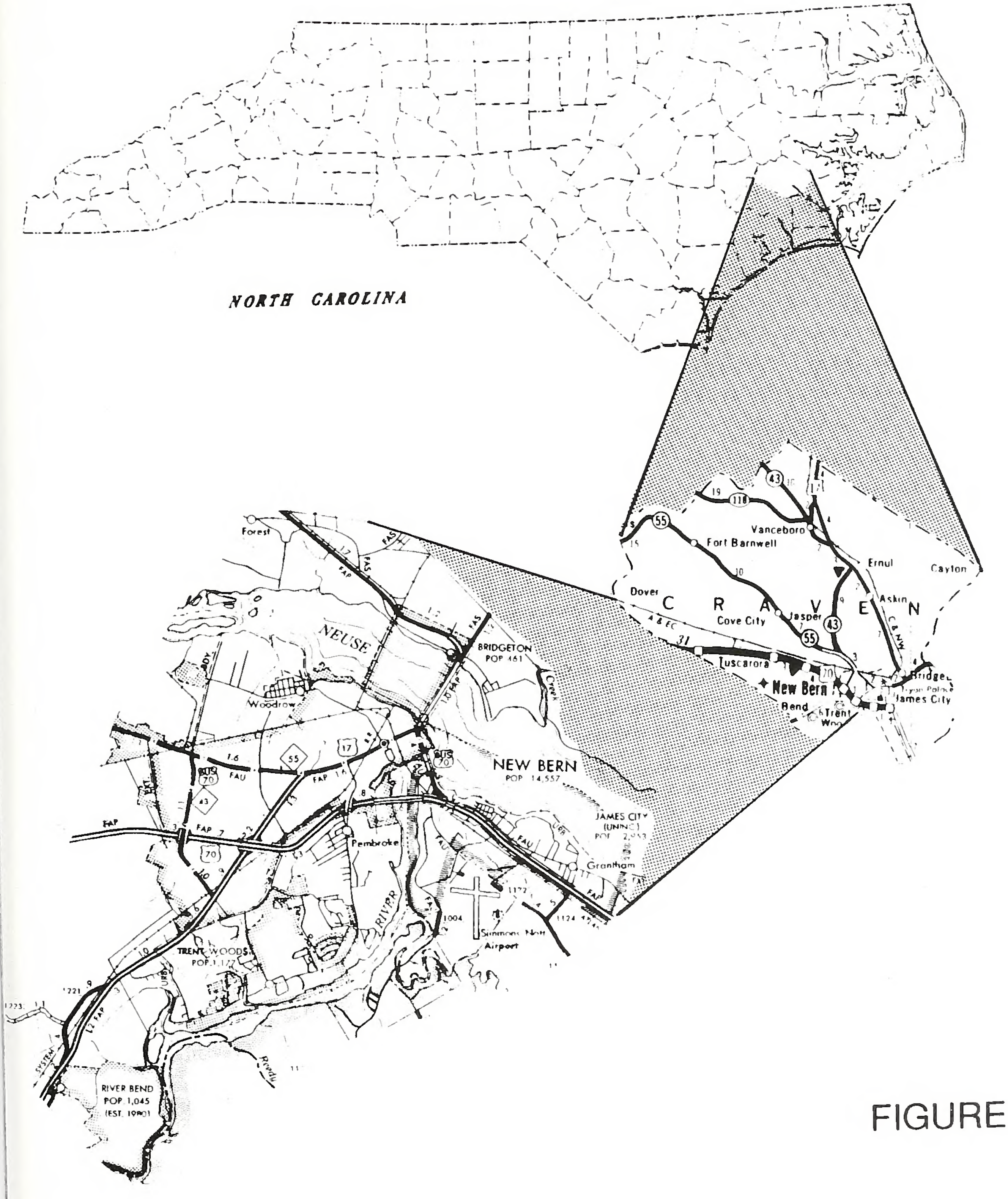


FIGURE 2

Coupled with the fact that the New Bern Area is very attractive to tourists and retirees it becomes very apparent that a transportation system is needed so that the potential of the area's assets can be maximized. Herein lies the value of transportation planning. If adjustments are not made to provide for additional travel demands, the area's growth potential could be stifled by inadequate opportunity for convenient travel between points of interest.

Factors Affecting Transportation

In order to formulate an adequate year 2015 thoroughfare plan, reliable forecasts of future travel characteristics must be achieved. The factors of population, vehicle usage trends, economy, and land use play a significant role in determining the transportation needs of an area, and they must be carefully analyzed. Additional items may include the effects of legal controls such as subdivision regulations and zoning ordinances, availability of public utilities, and physical features of the area. Examination of these factors helps to explain historic travel patterns and lays the ground work for thoroughfare planning.

The first step in the development of the thoroughfare plan is to define the planning period and the planning area. The planning period is typically on the order of 25 years. The base year for the New Bern-Bridgeton-Trent Woods-River Bend study was 1989, and the year 2015 was chosen to be the endpoint of the study period (26 years). The planning area is generally the limits to which some urbanization is expected to occur during the planning period. The planning area is then subdivided into traffic analysis zones, for the purpose of data collection and computer modeling. Figure 3 shows the planning area boundary and zones.

Population

Travel is directly related to population, and the volume of traffic is closely related to the size and distribution of the population which it serves. During the last decade, Craven County has experienced an 18 percent increase in population, or an annual growth rate of 2 percent. North Carolina has increased 13 percent over the same time period, or 1.25 percent a year. This higher than average growth rate for the County is expected to continue throughout the planning period of 26 years.

Secondly, large portions of Craven County are unsuitable or unavailable for growth. There is a large proportion of flood plain in the County, and the Croatan National Forest and the Cherry Point Marine Air Station occupy most of the southern part of the County. This preemption of land serves to "channel" development into the New Bern area. As a result, it is expected that the New Bern Area will become increasingly urbanized.

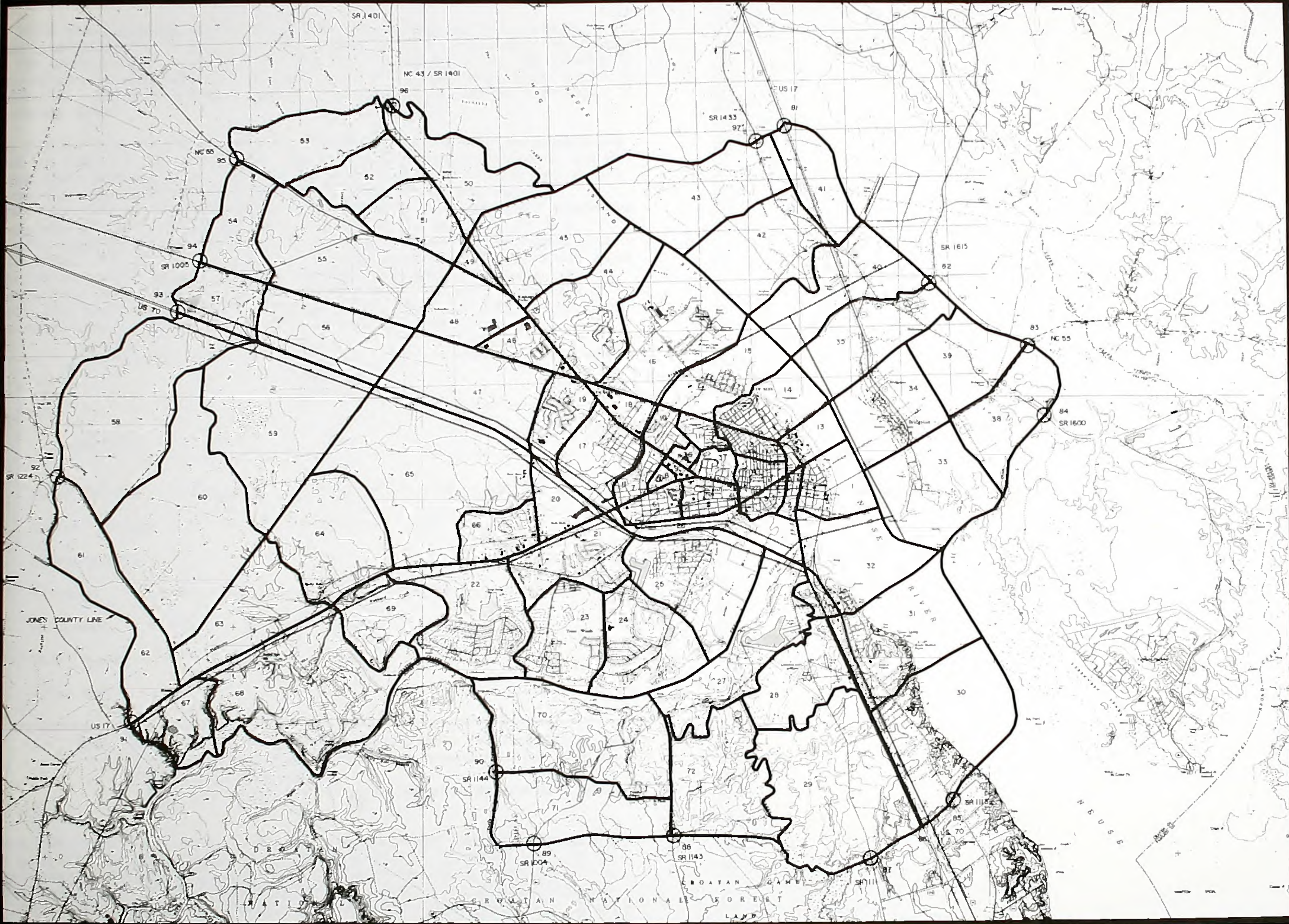


FIGURE 3

PLANNING AREA

LEGEND

▬	ZONE BOUNDARY
—	SCREEN LINES
00	ZONE NUMBER
○	EXTERNAL STATION LOCATION

NEW BERN

RIVER BEND TRENT WOODS BRIDGETON

JONES AND CRAVEN COUNTIES

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING GROUP

IN COOPERATION WITH
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

In 1975 the planning area contained 39 percent of the Craven County population. In 1989 the planning area contained 46 percent of the population, and by the year 2015 over half of the County's population is expected to be located in the planning area shown in Figure 3.. Table 1 shows population totals and trends for the planning area.

The population estimate used for development of the thoroughfare plan is that of the planning area. Since no historic data exist using this boundary, it was necessary to go out in the field and inventory the individual dwelling units (DU's) and use an estimated number of persons per DU to calculate the 1989 planning area population. The 1990 census reports an average of 2.6 persons per DU in Craven County, so that is the number used for this study. As shown in Table 1 the estimated 1989 planning area population containing the City of New Bern and the Towns of Bridgeton, Trent Woods, and River Bend was 37,816. Appendix C shows the number of dwelling units by traffic analysis zone, and the associated population data and calculations.

TABLE 1
POPULATION

LOCATION	YEAR 1960	1970	1980	1989	2015
North Carolina	4,556,155	5,082,059	5,881,766	6,331,288	8,500,000
Craven County	58,773	62,554	71,043	82,513	113,000
Planning Area	-	-	-	37,816	63,394
New Bern	15,717	14,700	14,600	16,300	29,000
Bridgeton	638	520	461	527	700
Trent Woods	517	719	1,177	2,228	8,000
River Bend	-	-	959	2,002	12,000

NOTE: Historic populations in the above table are from Census data.
State and County projections are from the Office of State Budget and Management.
Municipal projections were estimated using historic growth trends.

Once the base year population was established, the next step was to project the population for the year 2015. Population and employment projections were provided by the local participating municipalities and by Craven County. Again, the population was calculated based on an average "persons per DU", based on the type of dwelling unit. The national historic trend has shown the average number of persons per DU to be decreasing over time. With this in mind, the estimated persons per DU was reduced to 2.3 for the design year. The 2015 population was 63,394. The calculations for the year 2015 are shown in Appendix C.

Economy and Employment

One of the most important factors to be considered in estimating the future traffic or population growth of an area is the economic base. To a large degree, number of employees and the employee income in an area determines the population that can be supported and the number of motor vehicles that will be locally owned and operated. Generally, as the family income increases so does the number of vehicles owned and the number of vehicle trips generated by each household. Therefore, a thorough understanding of the factors making up the basic and non-basic sectors of the local economy is essential to an understanding of travel desires.

Table 2 shows the median family incomes for the US, the State, Craven County, and New Bern from 1969 to 1989. Data was not available for municipalities under 2500 population. Two general trends are evident from that table:

(1) Over the last twenty years, there have been significant increases in median family incomes.

(2) The median incomes of New Bern and Craven County have remained slightly below national and state levels, but they have followed generally the same upward trend.

These trends indicate the overall standard of living is increasing for the planning area and that job opportunities are resulting from the expanding economy.

TABLE 2
MEDIAN FAMILY INCOME

LOCATION	YEAR 1969	1979	1989
United States	8,486	16,841	34,000
North Carolina	7,774	16,792	30,200
Craven County	7,046	14,945	25,100
New Bern	7,338	14,159	19,900

NOTE: Data from the above table are from Census data.

Another indicator used in this study to quantify employee income was a housing classification inventory. As was mentioned in the population section every dwelling unit in the planning area was counted. Also, every dwelling unit was rated and classified according to value. The classifications were "excellent", "above average", "average", "below average" and "poor". Studies have shown that income and housing value are related, and that as the house increases in value so does the number of trips generated by that household. Fifty-six percent of the dwelling units in the planning were rated as being average or better. Appendix C, Table C-6 shows the total number of houses and their classifications.

A field survey was also taken of the places of employment and number of employees. These data were classified both by traffic analysis zone and by type of employment. The employment types used were: industrial, wholesale and retail, highway retail, office, and service. The survey indicated a total of 16,893 persons employed within the planning area. That results in an employment-to-population (E/P) ratio of 45 percent.

Local staff provided information on the expected allocation of employment within the area and anticipated increases in employment activity. For the design year 2015, total employment in the planning area was expected to increase to 27,470. The design year estimated employment yields an E/P ratio of 43 percent, a slight decrease. The decrease indicates that more of the population will be living in the planning area but working elsewhere.

Table 3 gives a brief summary of the employment information used in the study. The Standard Industrial Classification codes corresponding to each Employment Classification category are: Retail-Wholesale: 50-54, 56, 57, 59; Highway Retail (restaurants, gas stations): 55, 58; Office: 60-67, 91-97; Services: 70-76, 78-89, 99; and Industrial: 1-43, 45-49. A more detailed description of the employment distribution is given in Appendix C, Table C-7.

TABLE 3
EMPLOYMENT

Employment Classification	YEAR 1989	2015
Retail-Wholesale	3,287	4,194
Highway Retail	1,202	1,567
Office	1,783	3,911
Services	5,816	6,892
Industrial	4,805	10,906
TOTALS	16,893	27,470

Land Use and Development

The generation of traffic on a particular street is closely related to the land uses of the adjacent property on that street. Some types of land uses generate more trips than others. Also some land uses attract more trips than others based on the intensity and spatial separation of those developments. For example, a shopping center generates larger traffic volumes than a residential area. Therefore, it is important in transportation planning to differentiate land use types so their present and future distribution throughout the planning area can be used to determine existing and future traffic patterns.

There are several basic variables used to forecast future land development. Some of them are: anticipated population changes; historical trends in the different types of development; the availability and effectiveness of legal controls, regulations, and ordinances; the availability of utility and transportation facilities; and major topographic or other environmental features.

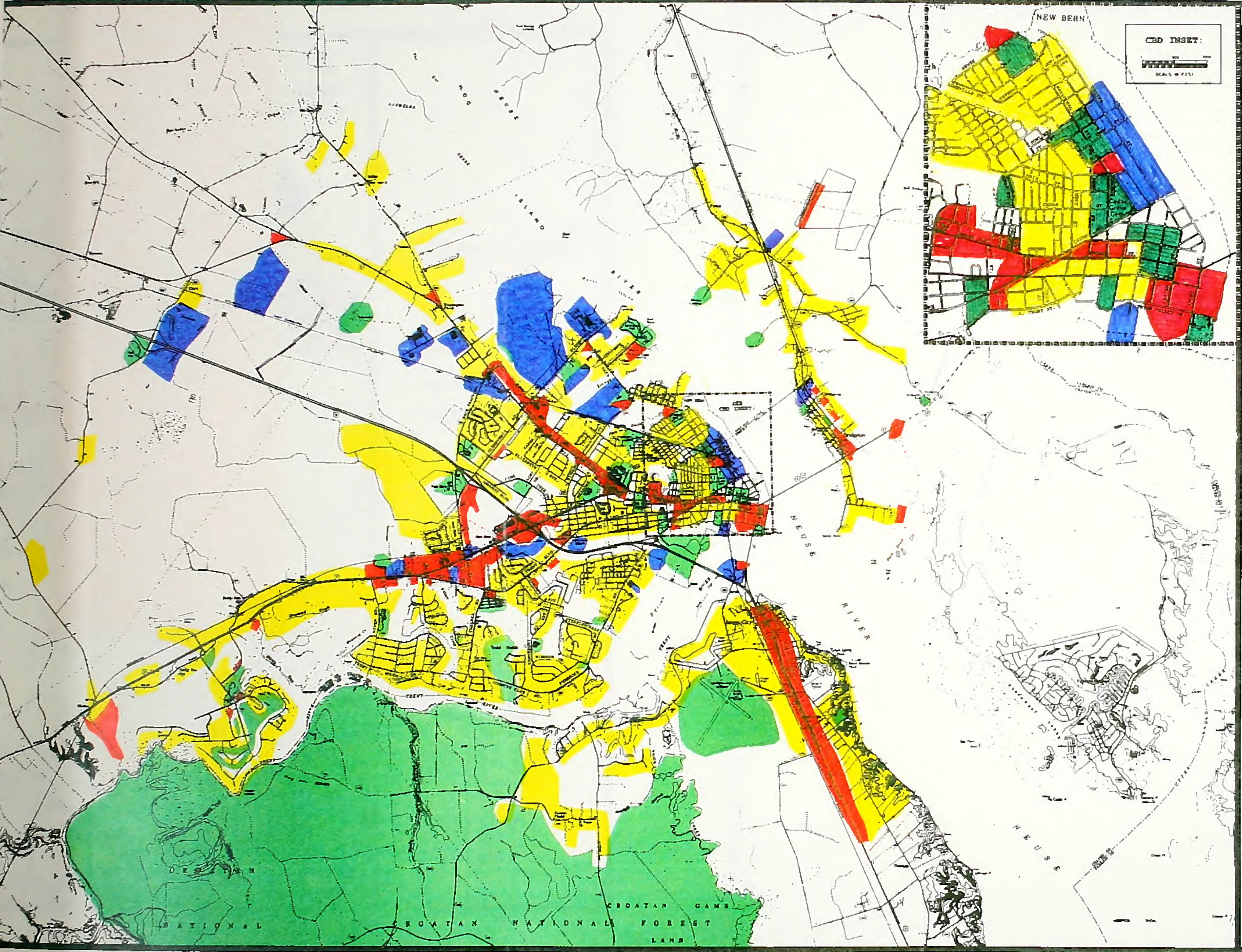
Input from the local staff and recent land use plans for the local municipalities and the County provided information on existing and anticipated land development and growth areas. This information was then used to allocate employment, population and housing projections on a zonal basis. The resulting travel patterns allowed for a determination of the type of facilities required to adequately serve the areas in the future. Figures 4 and 5 display the existing and anticipated growth patterns in the planning area.

There are no zoning regulations in Craven County, except within the incorporated municipalities. All of the municipalities, with the exception of River Bend, have extraterritorial jurisdiction over development within one mile of their city limit boundaries.

Currently, the majority of developed land in the planning area is devoted to residential use. Trent Woods and River Bend are dominantly residential. In New Bern and Bridgeton residential areas are interspersed with commercial, institutional, and industrial land uses.

The majority of the commercial uses have occurred in strip development along US 70 and US 17. A regional type shopping mall exist at the interchange of US 17 and US 70. In addition there are 29 acres of commercial business in New Bern's central business district.

Industrial development has similarly developed in close proximity to the major highways and railways. Water associated industries also exist along the Neuse and Trent Rivers.



EXISTING LAND USE

🟨	RESIDENTIAL
🟥	COMMERCIAL
🟩	PUBLIC
🟦	INDUSTRIAL

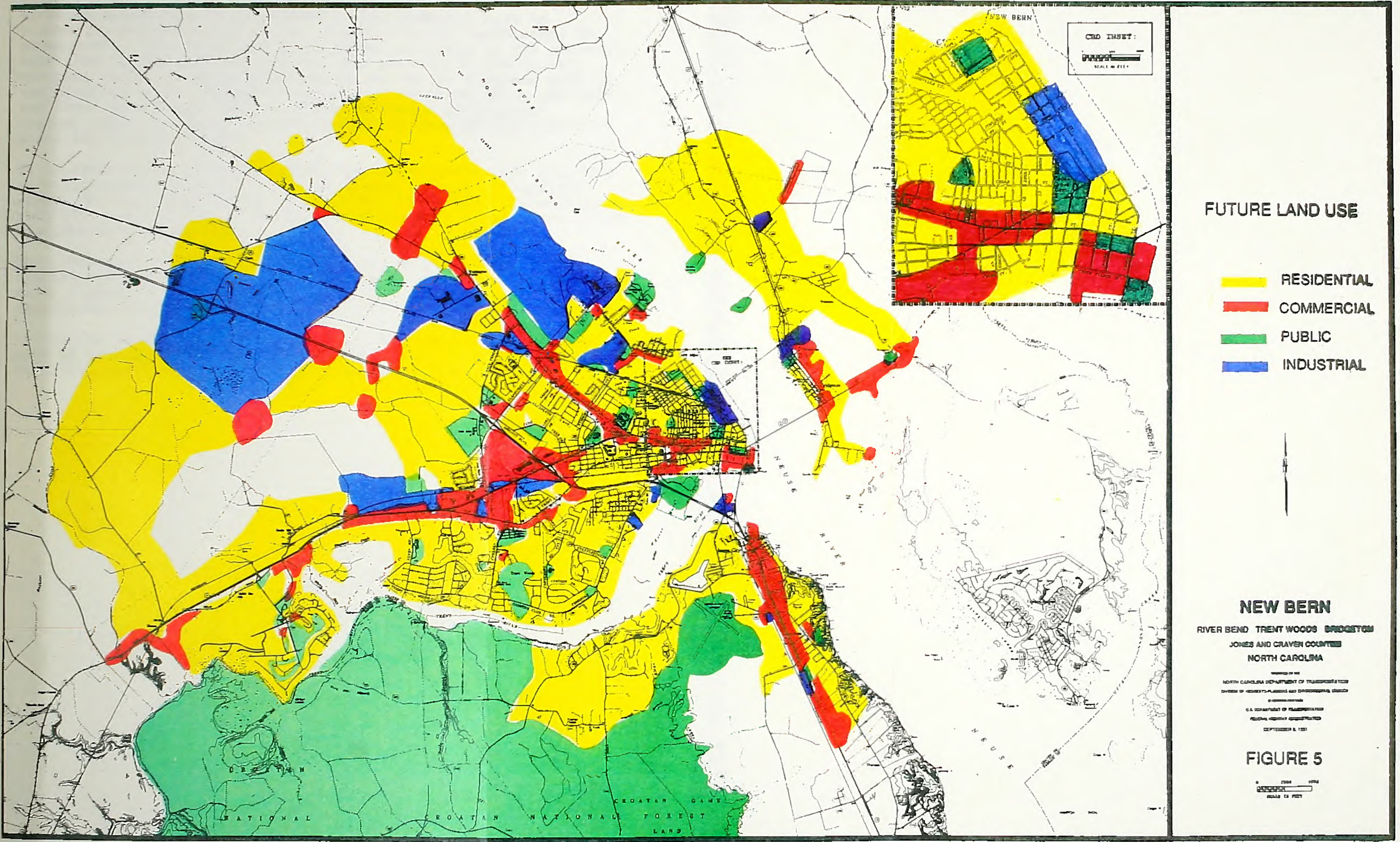
NEW BERN

RIVER BEND TRENT WOODS BRIDGETON
JONES AND CRAVEN COUNTIES
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS PLANNING AND ENVIRONMENTAL BRANCH
IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SEPTEMBER [illegible] 1991

FIGURE 4

SCALE IN FEET



NEW BERN
RIVER BEND TRENT WOODS BRIDGETON
JONES AND CRAVEN COUNTIES
NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

U.S. DEPARTMENT OF TRANSPORTATION

FIGURE 5

Although approximately 50 percent of the planning area is presently undeveloped there are several natural impediments to development. The Neuse and Trent Rivers converge in the planning area thus inhibiting land travel. The portion of the Croatan National Forest occupies practically the entire southern part of the planning area. Extensive acreage of wetlands along the Neuse and Trent Rivers and their tributaries limits development. However, there is still an ample supply of undeveloped land to allow for future growth.

It is anticipated that new residential development will continue to be the dominate land use in the future. Areas of expected growth in this category are Trent Woods, River Bend, Greenbriar vicinity, west of Race Track Road, and the far western part of the planning area along Tuscarora Road.

The commercial centers will continue be the present New Bern central business district and the strip development along the major highways. The new US 17 Bypass will create areas of spot development around interchanges.

Industrial development will expand out from the existing areas, such as the rock quarries, Weyerhaeuser, Hatteras Yachts, Bosch Machinery, and the Craven County Industrial Park.

IV TRAVEL FORECAST MODELS

General

While traffic volume counts on existing streets are useful in evaluating the ability of the current system to meet travel demands, they reveal little as to the actual travel desires (origins and destinations) of the motorist. For thoroughfare planning purposes, a comprehensive knowledge of the origins and destinations of existing traffic and estimated future traffic is essential.

The type, intensity, and location of the population and employment within an area largely determine the travel patterns. The method used to predict future travel involves the development of mathematical models relating population and employment to travel. Models are developed to (1) estimate trips produced (origins) and trips attracted (destinations) by traffic zones and (2) to estimate travel patterns between zones. Separate models are developed for the three basic types of trips: internal, internal-external, and through. **Internal trips** are defined as those trips which have both an origin and destination inside the planning area. An **internal-external trip** is a trip which has one end inside the planning area and the other outside. **Through trips** are defined as those trips which travel through the area and have both an origin and destination outside the study area.

The travel forecast models for the New Bern-Bridgeton-Trent Woods-River Bend area were developed on the basis of travel, employment and population data obtained for the base year 1989. The validity of the models was tested by comparing the traffic volumes computed by the models to traffic volume counts taken on the existing street system.

After travel forecast models have been calibrated so that they adequately duplicate travel, design year travel estimates are produced through the input of design year data on population and employment. The trip distribution models are sensitive to changes in the street system and variation will occur in the travel patterns as alternative future street plans are tested. A more detailed documentation of the travel forecast models is given in Appendix C.

Table 4 gives a summary of travel data trends for the area.

TABLE 4
TRAVEL DATA SUMMARY

Type	1989	2015
Average Daily Trips per DU	7.12	7.65
Internal Trips		
Home Based Work	25,888	52,761
Other Home Based	49,705	101,302
Non-Home Based, internal	27,959	56,982
NHB secondary	26,000	55,900
Internal <-> External	57,005	120,483
Through Trips	14,202	30,366
Total	200,759	417,794

Average Daily Trip/DU = the number of **internal** personal auto trips divided by total DU for 1989 and 2005

(103,552) / (14,543) = 7.12
(211,045) / (27,571) = 7.65

V ANALYSIS OF THE EXISTING SYSTEM

General

This chapter presents an analysis of the ability of the existing street system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies, but on understanding their cause. Travel deficiencies may be localized and the result of substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be caused by a system deficiency such as a need for a bypass, loop facility, construction of missing links, or additional radials.

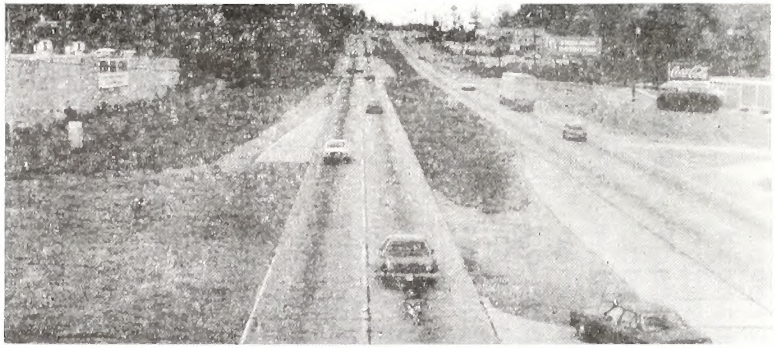
Existing Travel Patterns

An indication of the adequacy of the existing street system is a comparison of traffic volumes versus the ability of the streets to move traffic. In an urban area, a street's ability to move traffic is generally controlled by the spacing of major intersections, access control, width of pavement, and the traffic control devices (such as signals) utilized.

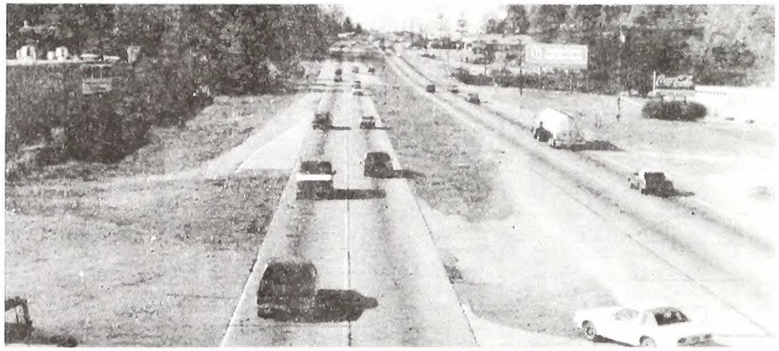
To measure a street's ability to move traffic the terms **capacity** and **level of service** are used. **Capacity** is the maximum number of vehicles which has a "reasonable expectation" of passing over a given section of a roadway, during a given time period under prevailing roadway and traffic conditions. The relationship of traffic volumes to the capacity of the roadway will determine the **level of service (LOS).** Six levels of service identify the range of possible conditions. Figure 6 shows the levels of congestion associated with the various levels of service. Table 5 gives a brief description of each LOS in accordance with the 1985 Highway Capacity Manual.

The recommended improvements and overall design of the Thoroughfare Plan were based on achieving a minimum of LOS D on existing facilities, and LOS C on new facilities. LOS C is defined as being in the zone of stable flow with most drivers restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is attained at this level of service.

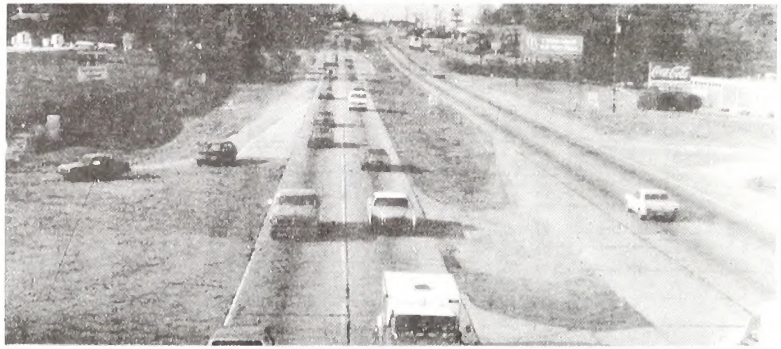
LOS D is tolerated on an existing facility before it is considered operating over its "practical" capacity, or that at which the public begins to express dissatisfaction (see Table 6).



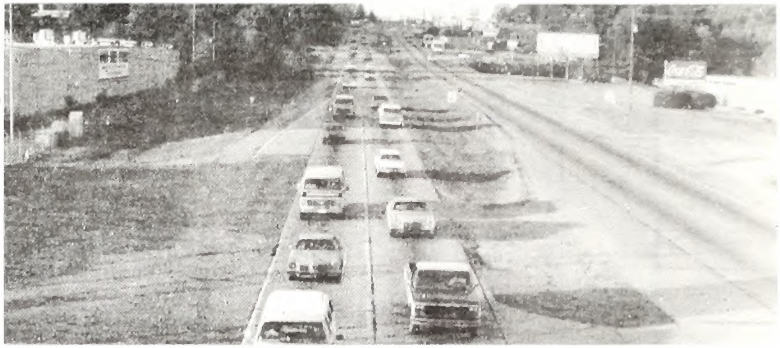
LEVEL OF SERVICE - A



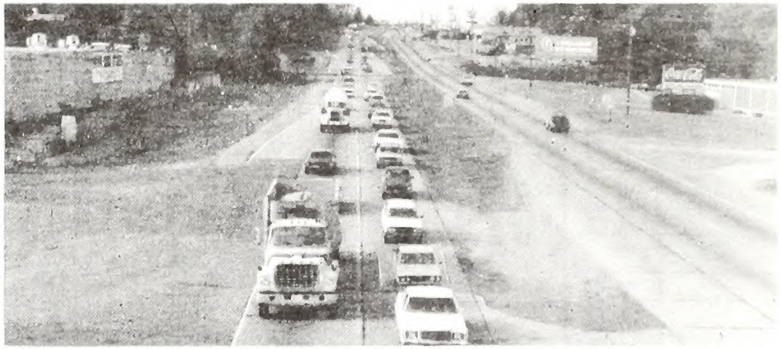
LEVEL OF SERVICE - B



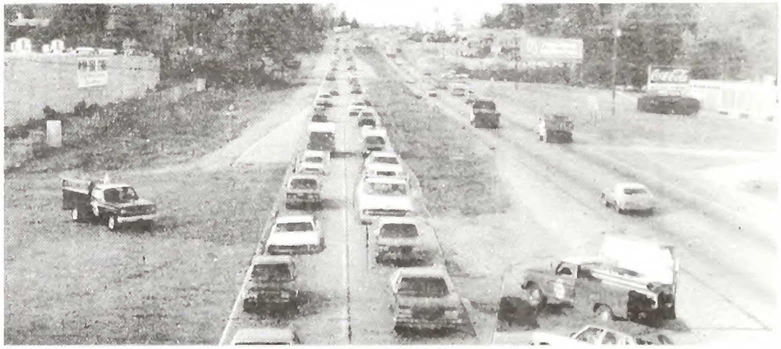
LEVEL OF SERVICE - C



LEVEL OF SERVICE - D



LEVEL OF SERVICE - E



LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE 6

TABLE 5
LEVEL OF SERVICE

LOS A - describes primarily free flow conditions. The motorist experiences a high level of physical and psychological comfort. The effects of minor incidents or breakdowns are easily absorbed. On an urban arterial, LOS A corresponds to a average travel speed of 25 to 35 mph.

LOS B - also represents reasonably free flow conditions. The ability to maneuver within the traffic stream is only slightly restricted.

LOS C - provides for stable operations, but flows approach the range in which small increases will cause substantial deterioration in service. Freedom to maneuver is noticeably restricted. Minor incidents may still be absorbed, but the local decline in service will be great. Queues may be expected to form behind any significant blockage.

LOS D - borders on unstable flow. Small increases in flow can cause substantial deterioration in service. Freedom to maneuver is severely limited, and the driver experiences drastically reduced comfort levels. Minor incidents can be expected to create substantial queuing. On an urban arterial, LOS D corresponds to an average travel speed of 9 to 17 mph.

LOS E - The boundary between LOS D and LOS E describes operation at **capacity**. Operations at this level are extremely unstable, because there are virtually no usable gaps in the traffic stream. Any disruption to the traffic stream, such as a vehicle entering from a ramp, or changing lanes, requires the following vehicles to give way to admit the vehicle. This condition establishes a disruption wave which propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing.

LOS F - describes forced or breakdown flow. Such conditions generally exist within queues forming behind breakdown points.

Table 6
Practical Capacity* for Urban Facilities

HIGHWAY TYPE	NUMBER OF TRAVEL LANES	VEHICLES PER DAY
urban arterial	2	8,000-12,000
urban arterial	3**	12,000-16,000
urban arterial	4	18,000-22,000
urban arterial	5**	24,000-28,000
urban arterial	6	30,000-34,000
urban arterial	7**	36,000-40,000
urban freeway	4	40,000-60,000
urban freeway	6	60,000-80,000

*Level of service D
**A center turn lane or two, four, or six lane facility with adequate turning lanes at key locations

When streets are operating below level of service "D", speeds are well below the speed limit and travel times are increased. In addition, maneuverability is severely limited and a driver's frustration level is generally much higher. This leads to driver's taking more chances on left turns and the distance between vehicles is severely diminished. Both of these factors result in additional accidents.

Capacity Deficiencies - Figure 7 depicts the base year (1989) major street system, and the **ADT** (Average Daily Traffic). A comparison of the base year (1989) ADT to capacities reveals several streets near or over practical capacity (LOS D). These areas are highlighted, and include:

NEW BERN

US 17 (Clarendon Boulevard) - The section from Glenburnie Road to Simmons Street is densely strip developed including three regional shopping malls. Numerous driveways, median cuts and traffic signals combined with 20,000 to 30,000 vehicles per day lower the level of service to an unacceptable range.

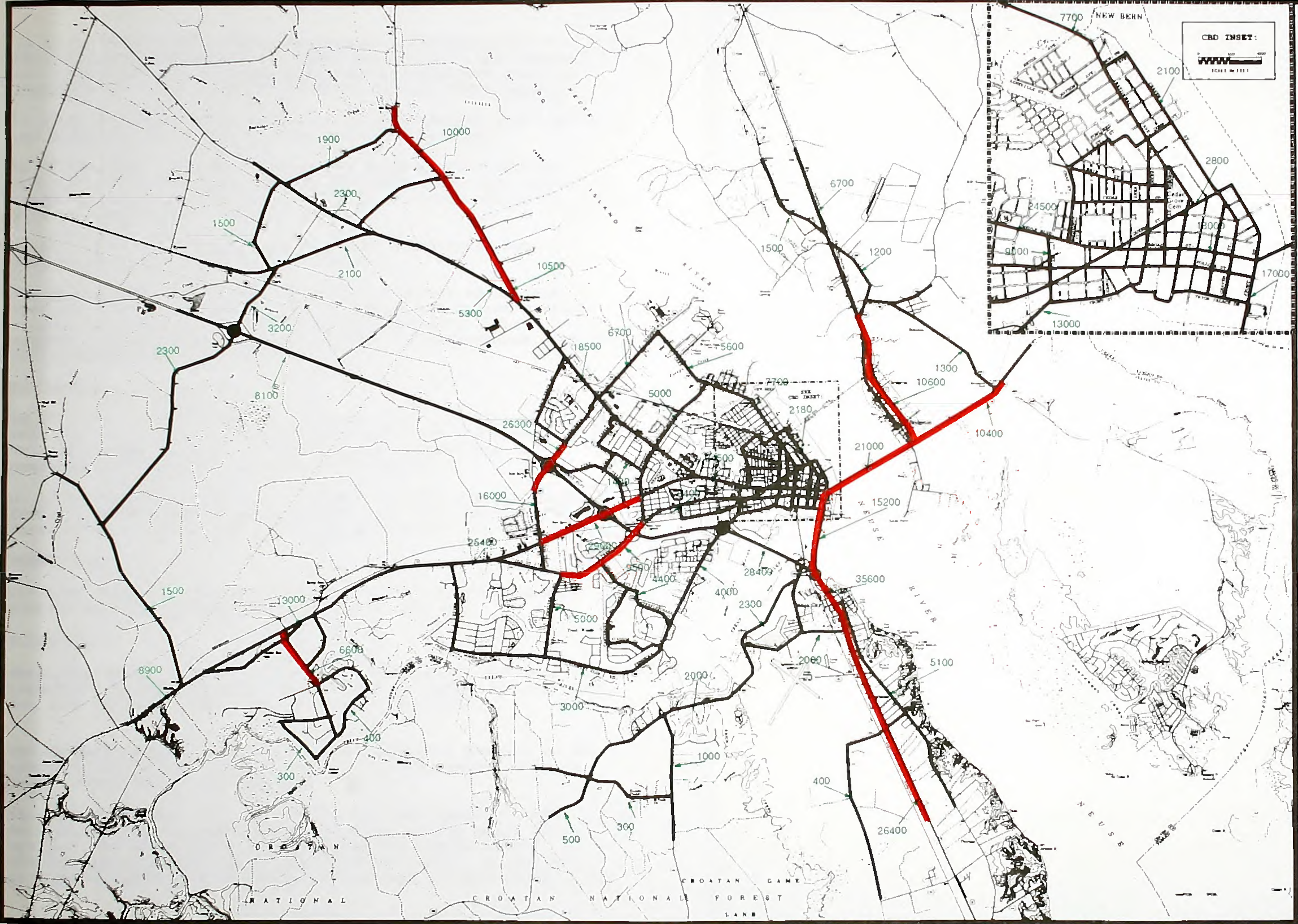


FIGURE 7

1989 DEFICIENCIES AND TRAFFIC COUNTS

LEGEND

CAPACITY DEFICIENCIES	▬
1989 TRAFFIC	0000

NEW BERN

RIVER BEND TRENT WOODS BRIDGETON
JONES AND CRAVEN COUNTIES
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FEDERAL HIGHWAY ADMINISTRATION
SEPTEMBER 6, 1991

SCALE IN FEET

US 17-NC 55-US 70 Bus (Neuse Boulevard) - The convergence of these three major arterials and the close proximity of the hospital cause this facility to experience capacity problems from the intersection of US 17 and NC 55-US 70 Bus. to First Avenue.

US 17-NC 55 (Neuse River Bridge) - It is presently over capacity and graded as being structurally deficient by NCDOT.

US 70 Business - The ever increasing beach traffic and work commuters to Cherry Point Marine Base have cause this highway to exceed its practical capacity, from Broad Street across the Trent River to the planning area boundary.

NC 43 - From the northern planning area boundary to the intersection with NC 55 is over capacity.

Glenburnie Road - Industrial development growth along this corridor from Oaks Road to Neuse Boulevard has caused traffic volumes to exceed the existing two lane capacity. The section from Greenbriar Parkway through the interchange with US 70 is rapidly approaching capacity.

BRIDGETON

US 17 - The section from Old Vanceboro Road (SR 1616) through the main part of Bridgeton to NC 55 is nearing its practical capacity. This is another situation where regional traffic has to unnecessarily mix with local Bridgeton traffic.

NC 55 - This facility carries a lot of traffic through Pamlico County from New Bern to the Pamlico Sound. The section from the Neuse River Bridge to the planning area boundary is over capacity.

TRENT WOODS

Trent Boulevard (SR 1278) - The section from Chelsea Road to Simmons Road has exceeded its practical capacity.

RIVER BEND

Shoreline Drive (SR 1222) - This is main entrance and exit for the community, so all the local traffic has to channel through this two lane facility, resulting in capacity problems.

System Deficiencies - System deficiencies are a measure of the extent to which the existing system lacks continuous radials, loops, cross-towns, and bypasses.

The street patterns for the central business district (CBD) of New Bern is the typical combination of radial routes and a grid system. The grid system or checkerboard pattern is very discontinuous, especially in the older sections. It has been frequently twisted in an attempt to conform to the radial routes and usable land area. This disjointed system has resulted in an above average number of streets for the land area served and short block spacings, which hinders traffic on the major streets. The newer areas show evidence of attempts to correct this problem with more continuity and better intersection spacing.

Simmons Street and Glenburnie Road serve as partial crosstown facilities and inner loops. They do a good job of providing traffic movement among the radial routes without using the CBD grid system.

The US 70 Bypass has by far done the most to relieve traffic congestion in New Bern. This four lane freeway has diverted thousands of through type trips away from CBD. Travelers from the mid-state population centers seeking seaside recreational opportunities no longer have to intermingle with the local traffic unless they choose to. US 17 serves the same function in a north-south direction as US 70 does in an east-west direction. However, traffic wishing to pass through the area on US 17 must travel through the most congested parts of the planning area by either using the business route which necessitates crossing the substandard Neuse and Trent River bridges or by following the signed bypass route which uses already congested urban arterial and crosstown streets. Bridgeton, Trent Woods, and River Bend also feel the effects of traffic volumes along existing US 17.

Trent Woods and River Bend are predominantly residential communities, and they are located such that through and regional type traffic do not affect local traffic flows. River Bend is a relatively new community with high growth potential, but it has only one primary entrance and exit to the community. This could be a serious problem in the future for traffic operations and emergency vehicle access.

Parking Inventory

Parking is a consideration in any thoroughfare planning study because it directly affects the capacity of individual facilities. On-street parking limits the capacity of a roadway, while a deficiency of parking adds to the congestion of an area by increasing circulation. Since on-street parking reduces the capacity of thoroughfares, parking removal is one of the first procedures applied in attempting to increase the capacity of a facility. Removal of parking is by far the least expensive improvement which can be made to increase the capacity of a street. Whenever removal of needed on-street parking is undertaken, off-street parking should be provided to replace that which has been removed.

The demand for parking can be obtained by multiplying a parking space factor by the daily auto trip destinations. In order to determine the daily auto trip destinations for the above defined downtown area, the zone boundaries would need to correspond with the downtown limits. An in depth parking study could be performed at a later date should it be found desirable by the local municipal Boards. NCDOT can provide this service for small municipalities through the Traffic Engineering Branch. Requests for further information should be sent to:

Accident Studies Engineer
Traffic Engineering
P. O. Box 25201
Room 205, Thompson Building
Raleigh, North Carolina 27611

Effects of 1989 Traffic on the Existing System

High Accident Locations - Traffic accident records are of assistance in defining problem areas and often pinpoint a deficiency such as poor design, inadequate signing, ineffective parking, or poor sight distance. Accident patterns developed from analysis of accident data can lead to remedial action that reduces the number of accidents and improves system efficiency.

Both the severity and number of accidents should be considered when investigating accident data. The severity of every accident is measured with a series of weighting factors developed by the Division of Highways of the NCDOT. In terms of these factors, a fatal or incapacitating accident is 47.7 times more severe than one involving only property damage, and an accident resulting in minor injury is 11.8 times more severe than one with only property damage.

Table 7 (continued on next page) lists all the intersections in the planning area with 10 or more accidents within 200 feet of the intersection in a two year period, and it shows the corresponding average severity index for each accident.

TABLE 7
HIGH ACCIDENT LOCATIONS

PRIORITY NUMBER	ACCIDENT LOCATION	SEVERITY INDEX	TOTAL NUMBER OF ACCIDENTS
1	US70 & CLARENDON	10.25	68
2	NEUSE & SIMMONS	9.21	61
3	BROAD & FRONT	11.50	45

TABLE 7 (CONTINUED)
HIGH ACCIDENT LOCATIONS

PRIORITY NUMBER	ACCIDENT LOCATION	SEVERITY INDEX	TOTAL NUMBER OF ACCIDENTS
4	US17 & GLENBURNIE	13.02	39
5	US70 & GLENBURNIE	6.39	31
6	FRONT & POLLOCK	5.69	31
7	GLENBURNIE & NEUSE	8.42	29
8	GLENBURNIE & BRUNSWICK	9.84	28
9	CLARENDON & RED ROBIN	8.60	28
10	BROAD & CRAVEN	7.31	27
11	BENFIELD & NEUSE	7.68	24
12	DEGRAFFENRIED & NEUSE	10.76	23
13	CLARENDON & SIMMONS	7.81	23
14	ELIZABETH & GLENBURNIE	21.42	22
15	CLARENDON & PINETREE	20.58	19
16	LONGVIEW & NEUSE	12.56	19
17	HAZEL & NEUSE	8.63	19
18	US70 & SR 1167	18.80	18
19	US70 & SR 1124	15.61	18
20	BROAD & GEORGE	10.56	18
21	HANCOCK & POLLOCK	4.06	18
22	FRONT & TRYON PALACE	19.18	17
23	NEUSE & RACE TRACK	14.96	17
24	BROAD & FLEET	5.55	17
25	BROAD & QUEEN	8.66	16
26	US70 & SR 1131	15.21	15
27	FIRST & POLLOCK	12.27	15
28	US17 & NC55	18.97	14
29	CEDAR & WEST	15.56	14
30	NEUSE & PROFESSIONAL	6.54	14
31	KENNEDY & NEUSE	7.88	13
32	BROAD & MIDDLE	4.40	13
33	AMHURST & GLENBURNIE	6.48	12
34	SIMMIONS & WOODLAND	5.58	12
35	HAZEL & SIMMONS	10.25	11
36	FLEET & POLLOCK	10.11	11
37	FLUCHER & NEUSE	10.11	11
38	BERN & BROAD	7.96	11
39	POLLOCK & QUEEN	3.95	11
40 *	US70 & SR 1116	53.55	10
41	COLONY & NEUSE	12.25	10
42	US70BUS & SR 1004	6.50	10
43	US17 & SR 1431	5.42	10
44	POLLOCK & CRAVEN	2.08	10
45	SR 1005 & SR 1243	51.88	6
46 *	US17 & C ST	14.86	5

* - INDICATES A FATALITY

VI. ALTERNATIVES ANALYSIS AND NEEDS

General

This chapter presents an analysis of the ability of the existing street system to serve the area's travel desires as the area continues to grow. The usefulness of transportation planning is in the analysis of different highway configurations for their efficiency in serving the area.

Goals and Objectives

Each area has its own priorities and concerns relating to the transportation system, and related topics. In order to determine the items of importance to people of the planning area, a "Goals and Objectives" survey was conducted in 1991.

Two hundred objective surveys were distributed to citizens in the New Bern-Bridgeton-Trent Woods-River Bend area. Approximately one fourth of the surveys were completed and returned. In the survey individuals were asked to evaluate twenty items on a scale of Not Desirable to Most Desirable as shown below.

```
    Not                                 Most
 Desirable          Neutral          Desirable

     1--------2--------3--------4--------5
```

There was also space provided for any additional comments. The results were then tabulated and ranked according to the overall weighted average in Table 8.

Improvement of the existing roads; preservation of historic structures; preservation of neighborhoods; and access to the central business district were by far the most desirable responses in the survey. Preservation of the historic district and creating a village type atmosphere in downtown New Bern were also the most often mentioned desires in the additional comments section. Mass transit, travel time, cost of travel, and vehicle exhaust pollution were most often listed as not being a high priority. The least desirable responses were new shopping centers, parking on heavily traveled streets, and one way streets. There were also several comments both for and against the bridge replacement study that is underway for the Neuse and Trent Rivers.

TABLE 8
RELATIVE DESIRABILITY
OF OBJECTIVES

RANK		VALUE
1	Improve existing road system	4.44
2	Preserve historic structures	4.31
3	Neighborhood preservation	4.30
4	Reduce congestion	4.24
5	Restrict access along major thoroughfares	4.21
6	Access to central business district	4.14
7	Economic growth	4.10
8	Sidewalks	4.07
9	Parks and playgrounds	3.93
10	Noise caused by vehicles	3.72
11	New industries	3.67
12	Boating access	3.59
13	Travel time	3.46
14	Vehicle exhaust pollution	3.19
15	Bus transit	3.12
16	Cost of travel	3.07
17	Carpool/Vanpool program	2.88
18	One way streets	2.38
19	Parking on heavily traveled streets	2.31
20	New shopping centers	2.24

Special Corridors

National Truck Network routes, as designated by the U.S. Secretary of Transportation for STAA vehicles, dated September 1989, includes US 70 and US 17 through the entire planning area. The North Carolina Intrastate System, revised December 1990, includes the same routes within the planning area. They are also part of the National Highway Defense System designated by the military.

Alternative Plans

The process of developing, testing and evaluating alternate plans involved a number of considerations. These included area goals and objectives (above), identified deficiencies (Chapter 5), environmental impacts, existing and anticipated land development, and travel service. Travel forecasts provided a basis for evaluation of alternatives as to the ability of the street system to serve future travel needs. Aerial photography, topographic mapping, field reconnaissance and discussions with town staff, officials and interested local citizens provided additional basis for identifying and evaluating the alternative alignments.

Do Nothing Alternative

A "do nothing" alternative was considered in weighing the desirability of developing a thoroughfare plan. This plan is essentially as the name implies, there are no construction improvements to the system. Regular maintenance would still be performed. Some of the major advantages of doing nothing are:

(1) No capital investment.
(2) No removal of landscaping.
(3) No additional land acquisition.
(4) No displacement of people or business as a result of construction.

However, there are a number of disadvantages to a "do nothing" policy which would have significant adverse effects on the urban environment. These include:

(1) Increased traffic congestion on major streets will cause traffic to divert to residential streets.
(2) Existing problem and "bottleneck" situations would worsen.
(3) Social, health, and safety standards would deteriorate.
(4) Increased driving time and road user costs.
(5) Increased accidents.
(6) Increased air pollution induced by traffic congestion.
(7) Reduced mobility for emergency vehicles.
(8) Reduced retail sales potential as a result of reduced accessibility.
(9) Increased driver frustration due to congestion.
(10) Loss of potential gains in tourist trade due to congestion.

In addition to the do nothing plan, it is desirable to take a more in depth look at the existing street system to determine if **non-construction** projects can enable the existing system to serve future travel. The applicability of non-construction projects to the Planning Area is as follows:

- **Control of access** increases capacity where highway capacity is reduced by large volumes of turning traffic at many closely spaced locations, such as at a strip commercial zone. US 17 between Trent Road and Neuse Boulevard is a good example of such development. As new development occurs, it would be beneficial to attempt to reduce or limit the number of curb cuts. As the remainder of US 17 develops, the transportation network would benefit from consideration of restricting future and existing access points.

- Existing street capacities would be improved by **removing on-street parking.** Prior to removal of on-street parking, the excess or deficiency of parking in the immediate area affected must be considered.

o The implementation of **one-way streets** would increase the capacity of the facilities by up to 50 percent. One-way pairs have the additional benefit of increasing the safety of the facilities involved.

o Prior to a traffic signal being installed on a facility, the through movement is permitted continuously. Upon signal installation, the time permitted for the through movement is significantly reduced to allow for conflicting movements, possibly by as much as fifty percent. This results in a reduced capacity for the facility. It is therefore important that signals only be installed when needed, and with consideration to the overall impact on the facility. Signal locations on US 17, Neuse Boulevard, Broad Street, and Glenburnie Road should be coordinated to provide for progression. Improving the progression of the traffic by updating and improving the traffic signal phasing and coordination allows traffic to move faster, and provides a capacity increase. Re-evaluation of the signal timing on these facilities is recommended.

o An aggressive **carpool, vanpool,** or **public transit** program would process the same number of person-trips while decreasing the number of vehicle-trips and thus decrease congestion. Currently the New Bern area does not have an historical pool of vehicle occupancy data to analyze for evaluation of the possible benefits of such a program. However, as much of the summer traffic is tourist related, a carpool program would have limited impact. Also the low density of development in the area is not conducive to public transit.

o **Bicycling** is increasing in popularity as a mode of transportation. In fact, the Board of Transportation states in its 1991 policy on bicycles, "...the Board of Transportation finds that bicycling is a bonafide purpose subject to the rights and responsibilities and eligible for the same considerations as other highway purposes...". The North Carolina Department of Transportation's Bicycle Coordinator is available to assist communities with bicycle route planning.

o **Altering work hours** such that the beginning and ending times are staggered, can reduce travel in the peak hour. The resulting peak period would be less congested, but last longer. Therefore, the total traffic carrying ability of an existing street can be increased.

o **Restrictions on growth** would also slow traffic growth, and delay the need for street improvements. This approach, however, would adversely affect the economy of the planning area.

The non-construction alternatives will improve operation on the existing system, but they alone cannot accommodate the long term traffic growth in the area. The do nothing concept, while an alternative, is not a viable alternative in transportation planning for the planning area because of the overwhelming disadvantages.

Existing Street System Plus Committed Projects

The existing plus committed system defines the street system that exists now plus the street projects that are programmed for construction in the North Carolina Department of Transportation's FY93-99 Improvement Program (TIP). Table 9 lists the major projects that are scheduled for the planning area that will affect traffic flows.

TABLE 9
SCHEDULED HIGHWAY IMPROVEMENT PROJECTS*

Project	Schedule		Estimated Cost ($1000)
	ROW	Construction	
US 17 Bypass	1993	1995	74,900
NC 55 Widening US17 to NC304	1996	1998	23,135
US 17 Widening SR1278 to US70 Bus.	1995	1996	4,550
New Neuse River Bridge	1994	1995	50,000

* From 1993-99 TIP. Schedules can change yearly.

It should be noted that inclusion of a project in the Transportation Improvement Program (TIP) represents only a commitment to provide improvements. Detailed project studies and environmental impact statements, that include public participation, must be done so that the best all-around improvement can be chosen for each project.

Figure 8 graphically shows the E+C street system and the capacity deficiencies that occur with year 2015 traffic travelling on that system.

This analysis will reveal future problem areas that need to be addressed beyond what is already programmed. It is also helpful in determining how well the programmed projects will alleviate the traffic problems they were designed for in the future.

The US 17 Bypass and the relocated Neuse River Bridge will completely eliminate any serious traffic problems in the central business district of New Bern. The proposed widening of US 17 along with the US 17 Bypass will raise the level of service on US 17 to a tolerable level, especially along the section that is heavily developed with shopping centers.

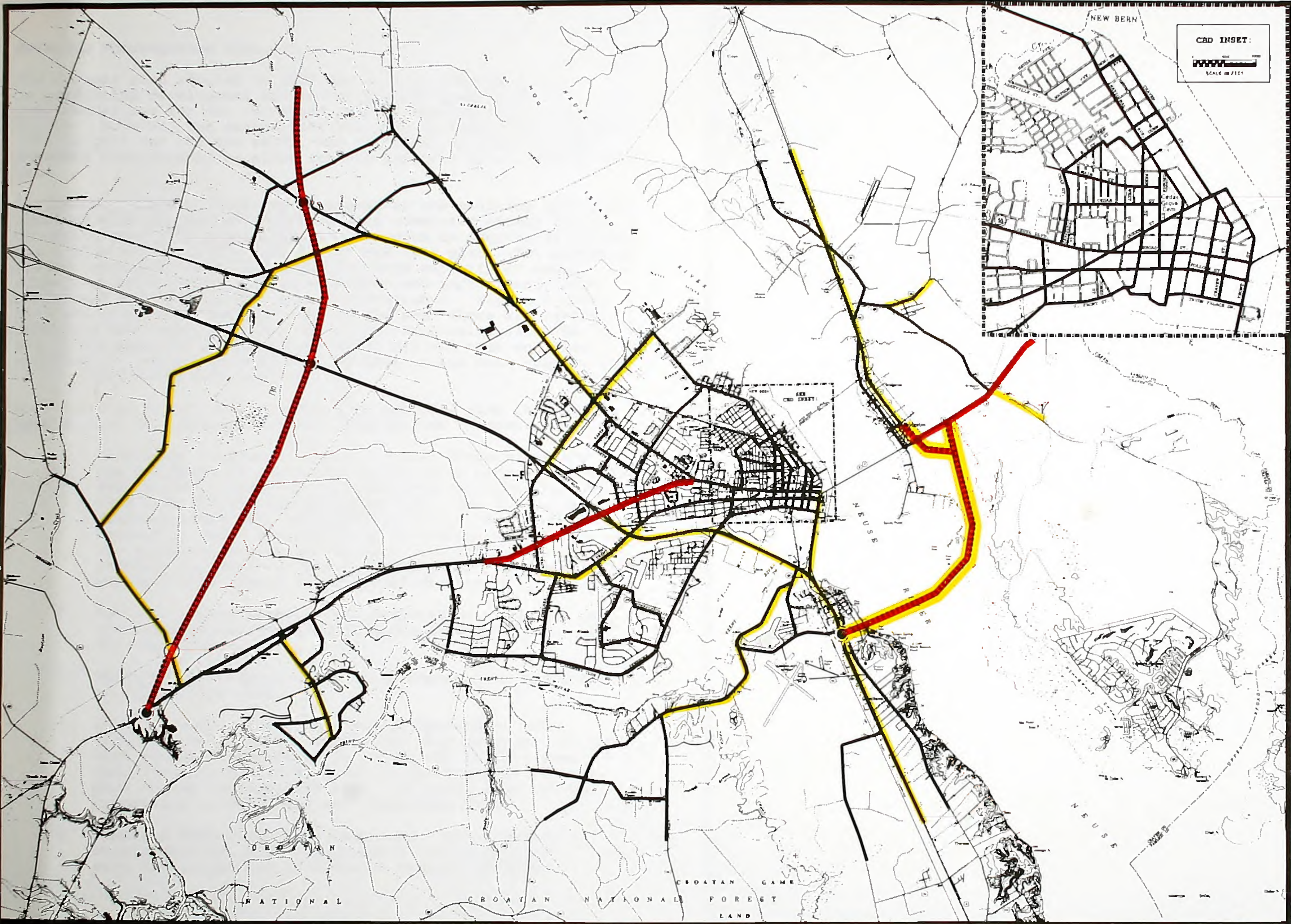

FIGURE 8

2015 DEFICIENCIES ON EXISTING PLUS COMMITTED SYSTEM

LEGEND

COMMITTED PROJECTS 🟥
OVER CAPACITY 🟨

NEW BERN

RIVER BEND TRENT WOODS BRIDGETON
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FEDERAL HIGHWAY ADMINISTRATION
SEPTEMBER 8, 1991

0 1000 1000
SCALE IN FEET

Existing Thoroughfare Plan

The current plan adopted in 1978 has done an admirable job in predicting development growth and providing adequate recommendations for the increased traffic associated with that growth. However, the design year has been extended from the year 2000 to 2015 for the new study, and the planning area has been expanded considerably to allow for the expected growth during that time.

Design year traffic (2015) was assigned to the existing 1978 plan combined with the current existing plus committed street system to determine what deficiencies might occur with an additional fifteen years of growth not accounted for in the 1978 plan. The projected volumes were then compared to the expected capacity of each roadway on this system so that each proposed improvement, both programmed and recommended, could be evaluated. Figure 9 shows the results of this analysis. As can be seen there are several corridors that need additional capacity, especially along US 70 and in the expanded planning area which has not been analyzed previously. Recommendations will be made in the next chapter that will rectify these deficiencies.

Also shown in Figure 9 are elements of the 1978 plan that have been deleted for various reasons. They are as follows:

1. Greenbriar Parkway Extension - Local dissatisfaction from the residents of Greenbriar Subdivision persuaded the New Bern Board of Aldermen to remove this project from the 1978 Plan and the new proposed Plan. The Statewide Planning staff felt this project was an important one, because it eased congestion on Glenburnie Road by giving the subdivision a second entrance and exit, and it provided for safer access to the high school via the proposed High School Road instead of US 17.

2. New South Front Street - The proposed US 17 Bypass and the proposed new Neuse River Bridge eliminated the need for this project.

3. Neuse River Bridge - It is being replaced on new location by a high rise span.

4. Oakland Avenue Extension - Mining operations and environmental concerns eliminated this project. If land uses change dramatically in the future in this area consideration should be given to putting this facility back on the Thoroughfare Plan. It would help relieve congestion on Oaks Road and Glenburnie Road.

5. Pembroke Road/Trent Road Connector - New residential development has made this project cost prohibitive along with the connection to Chestnut Avenue (SR 1279).

6. Elizabeth Avenue Extension - This is another project that was deleted due to local citizen opposition, even though right-of-way already exists for the extension. There are several large tracts of undeveloped land in the area that have potential for single and multi-family development. It is recommended that through the subdivision approval process that some sort of connection can be made from Elizabeth Avenue to Glenburnie Road when these areas develop.

7. K Street Extension - This facility would have served several good purposes if it had not been deleted by neighborhood opposition. First it would have allowed for greatly improved circulation in one of the older parts of New Bern that has narrow substandard streets with no continuity. Second, it would have created a new and much needed railroad crossing. At present the crossings are very limited which increase emergency vehicle response time. Third, some traffic could have been diverted away from the already crowded National Avenue and Broad Street Corridors. Serious consideration should be given to adding this facility back to the Thoroughfare Plan at the earliest opportunity.

8. Cedar Street Extension - This is in the same area as the K Street Extension and would have provided the same type service.

9. Hazel Ave/Washington Street/Garfield Street Connector - The same principles apply here as they did for K Street, except this would have been an east-west facility where K street is north-south.

Recommended Alternative

This final alternative (Figure 10) is a combination of the existing plus committed system, the 1978 Thoroughfare Plan, and some new additions proposed to help alleviate deficiencies in the existing plan and the expanded planning area used in the new study. Chapter 7 discusses in detail the aspects of the recommended plan.

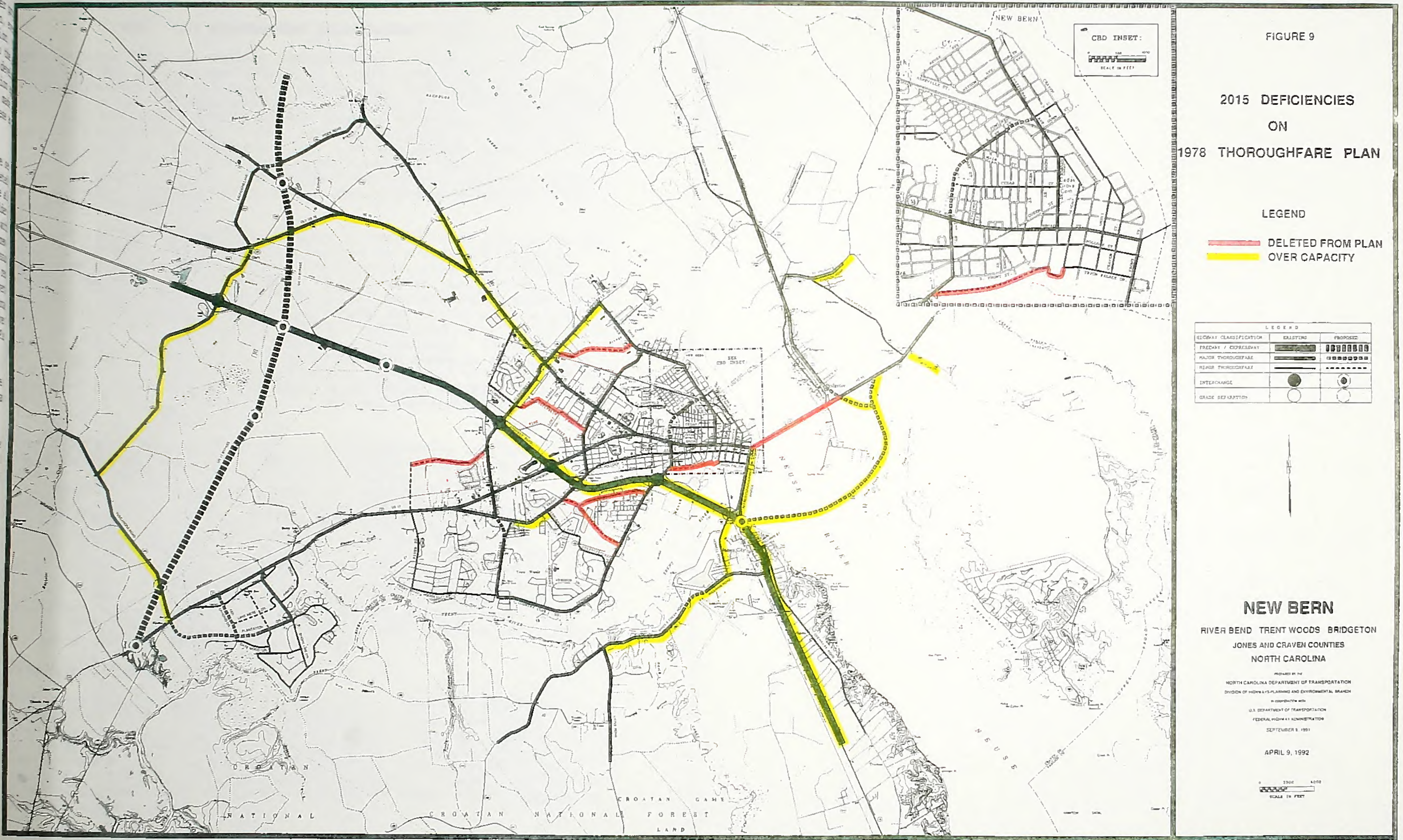


FIGURE 9

2015 DEFICIENCIES
ON
1978 THOROUGHFARE PLAN

NEW BERN

RIVER BEND TRENT WOODS BRIDGETON
JONES AND CRAVEN COUNTIES
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-PLANNING AND ENVIRONMENTAL BRANCH
IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SEPTEMBER 9, 1991

APRIL 9, 1992

VII. THE RECOMMENDED THOROUGHFARE PLAN

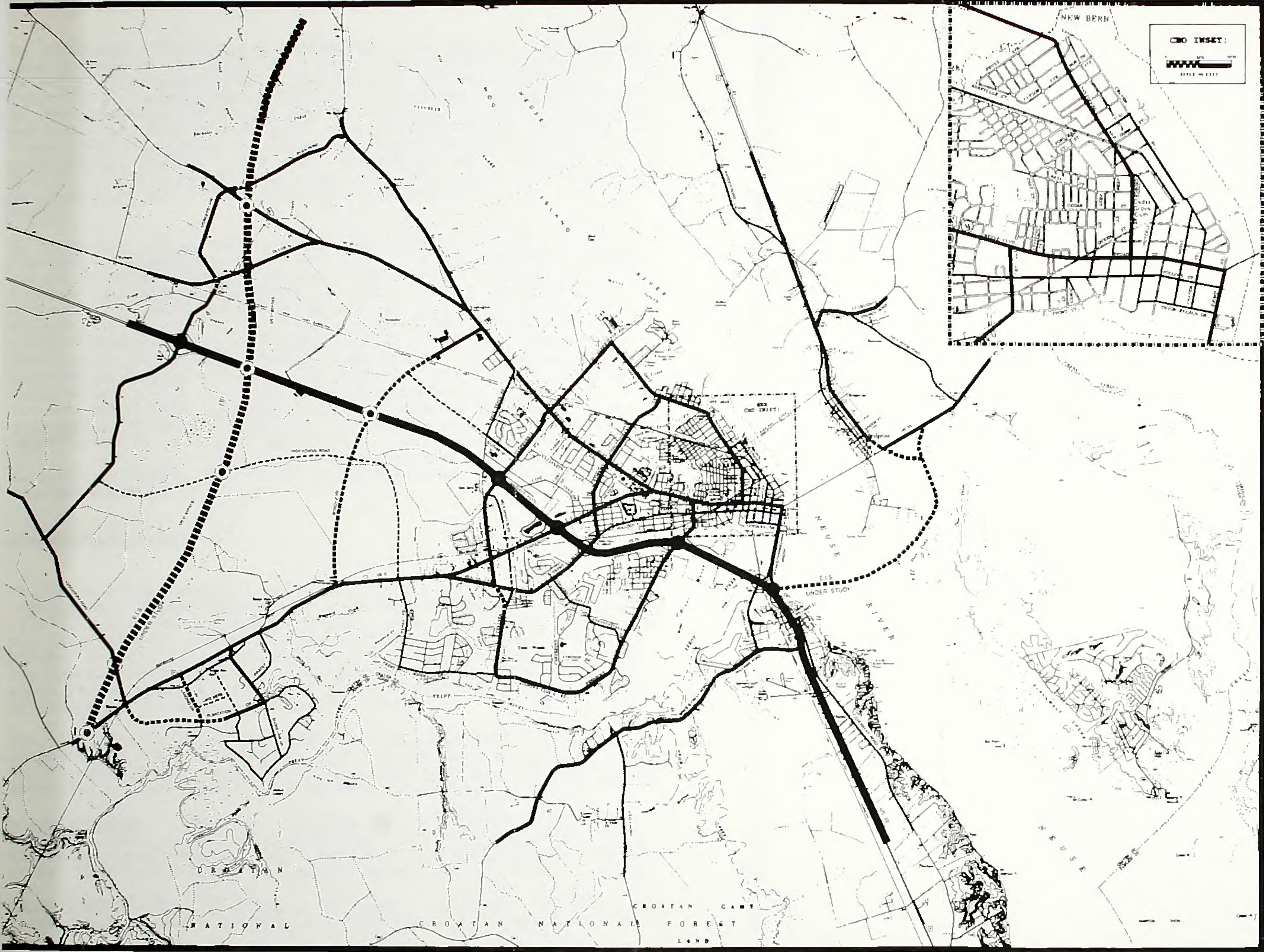
The revised 1992 New Bern-Bridgeton-Trent Woods-River Bend Thoroughfare Plan is the result of a very extensive, comprehensive, and cooperative effort that should help determine priorities for transportation projects well into the next century. It should be emphasized that this plan is based on anticipated growth as indicated by current land use projections. Prior to construction of specific projects, a more detailed study will be required to evaluate the need, exact location, and any environmental concerns. Public participation will be solicited throughout this process, as it was during the development of the thoroughfare plan.

Throughout the thoroughfare planning process it was the desire of the Statewide Planning Branch to arrive at a thoroughfare plan that was not only technically proficient but also a plan that would meet with public approval. Public participation has been actively solicited throughout the entire process which began with a locally appointed committee to project the socioeconomic data in the fall of 1989. Input was routinely solicited from local policy boards, civic groups, and public drop in sessions. Several projects were deleted or altered and others added as a result of this process. This cooperative effort culminated with the mutual adoption of the Thoroughfare Plan by New Bern, Bridgeton, Trent Woods, River Bend, Craven County, and the North Carolina Department of Transportation.

The following recommended plan, shown graphically in Figure 10, will be divided into three sections for discussion purposes. They are freeways/expressways, major thoroughfares, and minor thoroughfares. All other streets are considered to be local collector streets. Only thoroughfares that have recommendations of major widening or proposed new alignments will be elaborated upon. All others will be simply listed in the appropriate functional class section. Appendix A of this report contains a detailed listing of all thoroughfares on the Plan including: street name, reference points, existing roadway and right-of-way widths, capacities, present and future traffic volumes, and recommended design year cross sections and right-of-ways. It would be helpful to the reader to refer to Appendix A and Figure 10 while reading the following sections.

Freeways and Expressways

The freeway/expressway system provides for fast and efficient movement of large volumes of traffic in an urban area. Its function ranges from serving as a bypass for through traffic; or for facilitating movement of traffic from outlying points and intermediate areas to the central area; to moving traffic among radials in the more suburban areas. Properly located freeways and expressways help relieve usually congested radials and increase overall travel time.



ADOPTED BY:
BRIDGETON JUNE 1, 1992
TRENT WOODS JUNE 9, 1992
RIVER BEND MAY 11, 1992
NEW BERN JULY 14, 1992

RECOMMENDED FOR APPROVAL BY:
NC DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH JULY 22, 1992

ADOPTED BY:
NC DEPARTMENT OF TRANSPORTATION AUGUST 14, 1992

PUBLIC HEARING:
BRIDGETON ——
TRENT WOODS ——
RIVER BEND MAY 11, 1992
NEW BERN JUNE 9, 1992

REVISIONS

ADOPTED BY CITY OF TRENT WOODS	ADOPTED BY CITY OF BRIDGETON	ADOPTED BY CITY OF RIVER BEND	ADOPTED BY CITY OF NEW BERN	RECOMMENDED BY STATEWIDE PLANNING BRANCH	NORTH CAROLINA BOARD OF TRANSPORTATION
			July 14, 1992	July 22, 1992	August 14, 1992
		March 11, 1992		April 21, 1992	May 7, 1992

LEGEND

HIGHWAY CLASSIFICATION	EXISTING	PROPOSED
FREEWAY / EXPRESSWAY	▬	▮▮▮▮▮▮▮▮
MAJOR THOROUGHFARE	▬	■■■■■■■■
MINOR THOROUGHFARE	—	- - - - - -
INTERCHANGE	●	◉
GRADE SEPARATION	○	◌

FIGURE 10

THOROUGHFARE PLAN

NEW BERN

RIVER BEND TRENT WOODS BRIDGETON
JONES AND CRAVEN COUNTIES
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS STATEWIDE PLANNING BRANCH
IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SEPTEMBER 9, 1991

JUNE 1, 1992

0 2000 4000
SCALE IN FEET

US 17 Bypass - This is a programmed project that will be a four lane freeway on new location. The location shown in Figure 10 is only one of several alternatives being studied. The exact location will not be determined for another nine to twelve months. If an alternative is chosen that is radically different from the one shown it would be advisable to rerun the traffic assignment model since the location affects the amount of traffic on the major radial routes in the area. This facility will allow regional traffic on US 17 to bypass the local municipalities thus relieving congested local corridors and improving local traffic flow.

US 70 BYPASS - This four lane divided freeway/expressway serves the same function in an east-west direction that the US 17 Bypass serves in a north-south direction. It is the primary link for the Piedmont area of the State to the coast as well as serving the Cherry Point Marine Base and the proposed air cargo facility in Kinston. This corridor will experience tremendous growth in traffic volumes over the next 25 years. It is anticipated that the freeway section from the Glenburnie Road interchange to the Trent River Bridge will need eight lanes. The section from the Trent River Bridge to the planning area boundary that is not freeway needs to be six lanes, and it needs to be brought up to freeway standards by controlling the access with service roads and interchanges at strategic locations. Since future bypasses are impractical in this area it is imperative that the planning for future development include plans for efficient traffic flow in this corridor.

Major Thoroughfares

The major thoroughfares are the principle traffic carriers of the urban area. Their function is to move intra-urban and inter-urban traffic. The streets which comprise the major thoroughfare system may also serve as access to abutting property; however, their primary function is to carry traffic. Too much access decreases the travel speed along the thoroughfare and causes "bottlenecks" which necessitates the need for traffic signals. The end result is reduction in capacity of the facility.

The following is an alphabetical listing/description of the streets that compose the major thoroughfare system on the Thoroughfare Plan. Appendix A has a more specific listing of each facility if more technical information is desired.

BOSCH BOULEVARD - This is a proposed partial loop facility that will aid local traffic flow among NC 43/55, US 70, and US 17. It will also provide access and travel for future development in one of New Bern's projected high growth areas.

BROAD STREET - This is the primary radial route into New Bern. It currently is signed to carry US 17 Business, US 70 Business, and

NC 55 traffic. The section from the junction of US 17 and NC 55 to First Street is projected to exceed its capacity by the design year. It will need to be widened to at least six lanes. The lack of right-of-way and the dense strip development along this section will be cost prohibitive. If the "K" Street Extension were put back on the thoroughfare plan it would take enough traffic away from this section to allow it to operate within an acceptable level of service. If this cannot be done then consideration could be given to constructing a substandard six lane section with nine to ten foot lane widths and a strip median. The remainder of Broad Street from First Street to Front Street is projected to be adequate for future traffic. The City of New Bern's Urban Design Plan recommends narrowing this section of the corridor to enhance the gateway into the Central Business District. I think a parkway type four lane design with sidewalks and plantings could be accommodated when the new Bridge and the US 17 Bypass are completed.

CHELSEA ROAD (SR 1200) AND REALIGNMENT -It is the most heavily traveled road in Trent Woods. Many residents use this facility to access Glenburnie Road which is a major loop facility for New Bern that intersects with all the major radials in the City. In order to facilitate this movement for the residents of Trent Woods a realignment of Chelsea was recommended so a direct connection with Glenburnie Road could be achieved at Trent Road. The realignment will also ease congestion on Trent Road. It is recommended that Chelsea Road and the proposed realignment be three lanes. The remaining existing section of Chelsea is designated as a minor thoroughfare and will be discussed in that section.

COUNTRY CLUB ROAD (SR 1200) - This is a residential type street in Trent Woods, but it also serves as one of the primary entrances into the community. It has direct access to US 70 Bypass and downtown New Bern. Projected design year traffic will approach the practical capacity of this thoroughfare. Due to the residential nature of this facility and the volume of turning traffic associated with that function, widening to three lanes is recommended.

EAST FRONT STREET AND TRENT RIVER BRIDGE - This entire facility is projected to be over capacity by 2015. Front Street should be widened to five lanes and the bridge should be widened to four lanes. This area of New Bern is part of a National Register Historic District so widening impacts should be kept to a minimum. Initial assumptions were that traffic would drop substantially on the Trent River Bridge when the Neuse River Bridge was relocated. This was proved incorrect when the trip distribution model indicated that a large number of trips were originating within and had destinations to the New Bern Central Business District from the Bridgeton and Pamlico County areas. The shortest distant for these trips is via the Trent River Bridge.

FIRST STREET (SR 1200) - Smooth operation of this facility will become very important when the Neuse River Bridge is relocated.

It will become the most efficient way to enter the City of New Bern from the North and the East. A four lane divided urban type cross-section is recommended with a grass median. This will allow for enhancement of the visual appearance as traffic enters the City.

GEORGE STREET (SR 1403) - The existing cross-section is anticipated to be adequate throughout the design period for this thoroughfare.

GLENBURNIE ROAD (NC 43/SR 1309/SR 1402) - This route is the major north-south crosstown facility in New Bern. It allows easy access to all the major east-west radials in the City. The section from McCarthy Boulevard across US 70 to Neuse Boulevard will experience a doubling of traffic over the next 25 years. A seven lane cross section is recommended. The section from Neuse Boulevard to Oaks Road will require four lanes to accommodate future growth.

HALF MOON ROAD (SR 1600) - The short 0.35 mile section from Old Vanceboro Road (SR 1616) to St. Delights Church Road (SR 1615) along with a portion of SR 1616 and SR 1615 forms an important radial thoroughfare from the northeastern part of the County to US 17. It is projected to be over capacity and should be widened to four lanes. The remainder of Half Moon Road is designated as a minor thoroughfare and will be discussed in that section.

NATIONAL AVENUE (SR 1403) - National Avenue along with George Street, Oaks Road, Glenburnie Road, and Simmons Street comprise a loop system for New Bern that facilitates travel in the northern part of the City.

NC 43 - This is a heavily traveled route between Craven and Pitt Counties. It is also a major radial route for the entire planning area. It carries a lot of US 17 Bypass type traffic that is trying to go north-south through the area. When the US 17 Bypass is constructed, NC 43 will function more as a local traffic carrier. However, it will still carry volumes of local traffic that exceed its practical capacity. Four lanes are recommended beginning at SR 1419 coming from the North to NC 55, and six lanes are recommended from NC 55 to Glenburnie Road. The remainder of NC 43 is signed along Glenburnie Road and terminates at US 17.

NC 55 - This facility functions as an intra-county route west of the Neuse River, but it is the primary route used to get from Pamlico County to the planning area. A four lane divided section is recommended coming from the Northwest at SR 1243 to NC 43. From there to the Neuse River it runs concurrently with NC 43, Neuse Boulevard, and Broad Street. In Bridgeton it is recommended that five lanes be constructed from the New Neuse River Bridge to Half Moon Road and four lanes divided from there to the Planning Area Boundary. These improvements in this section are scheduled for construction by NCDOT in 1998.

NEUSE BOULEVARD - This is a heavily stripped developed radial in New Bern that also carries NC 55 and US 17 Business traffic. The proposed US 17 Bypass and the new Neuse River Bridge will relieve a lot of the congestion on this route, but it is still expected to approach its practical capacity by the year 2015. Widening would probably be cost prohibitive due to development along the corridor. If the "K" Street Extension were put back on the Thoroughfare Plan and constructed, Neuse Boulevard would probably operate at a more tolerable level of service in the future.

NEUSE RIVER BRIDGE REPLACEMENT - The existing bridge is scheduled to be replaced on new location by NCDOT beginning in 1995. The new location will relieve congestion in downtown New Bern and eliminate the conflict that exists now with boat and automobile traffic. It will also connect to the US 70 Freeway in New Bern and an improved NC 55 in Bridgeton, which will permit a much smoother flow of traffic between the two municipalities. The City of New Bern is concerned about the visual impact the structure will have on the downtown area and Union Point. They have asked that this be an important consideration during the Environmental Study. That environmental study is presently underway and on schedule. The structure will be at least four lanes wide and possibly six if funding permits.

OAKS ROAD (SR 1403) - This is the continuation of the National Avenue and George Street thoroughfare that makes up part of a loop system around the northern part of New Bern. Anticipated future traffic will require three lanes. Some houses in the area are very close to the pavement and will be impacted by the widening. Narrower lane widths could be considered to minimize the impact.

PEMBROKE ROAD (SR 1200) - This facility is the continuation of Country Club Road and together they serve as a major radial for Trent Woods with direct access to US 70 Bypass. Widening to three lanes is recommended to accommodate future traffic and driveway turning movements. The section from US 70 Bypass north to First Street is going to become an important facility for accessing the central business district of New Bern when the US 17 Bypass and the new Neuse River Bridge is built. A four lane divided cross-section is recommended with a grass median and possible landscaping.

PLANTATION DRIVE - The portion of this facility that is designated as a major thoroughfare and its proposed extension is intended to be the primary east-west facility through River Bend. It will also allow another entrance and exit for the Town. The two functions that this thoroughfare provides are the most needed in River Bend. It is imperative that this facility be protected and constructed if River Bend is to have efficient traffic flow in the future. The remaining section of Plantation Drive is a minor thoroughfare and will be discussed in that section.

SAINT DELIGHTS CHURCH ROAD (SR 1615) - This is a major radial serving the northeastern part of Craven County to US 17, and it will need to be widened to four lanes.

SHORELINE DRIVE - This is presently the major route into and out of River Bend, consequently it carries the most traffic. Even with proposed new entrances and exits it will still exceed its practical capacity from US 17 to Plantation Drive and should be widened to three lanes.

SIMMONS STREET (SR 1215) - This is a partial loop facility for New Bern, and it allows ease of movement among the major radials and crosstown routes traversing the City. The section from US 17 to Neuse Boulevard will warrant a good four lane section in the future. The two lane section that approaches Oaks Road should be widened to four lanes. There are some homes close to the existing pavement that will be impacted by the widening. Every effort should be made to minimize that impact.

SR 1004 (BRICE'S CREEK ROAD) - The southeastern section of the Planning Area below the Trent River relies almost exclusively on this facility for access. Additional facilities are not likely in the future because the area is circumscribed by the Croatan National Forest and sensitive wetlands. It is imperative that a high level of traffic service be maintained on this thoroughfare.

SR 1004 (BRICE'S CREEK ROAD)/SR 1167 (WILLIAMS ROAD) CONNECTOR - This proposed connection will allow for better access to US 70 from the rapidly developing southeastern section of the planning area. The airport has raised concerns about a conflict with their runway, but a feasibility study conducted by NCDOT indicated the two facilities could coexist.

SR 1005 (OLD US 70) - This major arterial has county wide significance as well as an important urban function in the northeastern part of the planning area. When the US 17 Bypass is constructed through this area, development will increase significantly. It is recommended that the section from Clarks to NC 55 be widened to a four lane divided facility.

SR 1167 (WILLIAMS ROAD) - In conjunction with Brice's Creek Road and the proposed connector, this route will be important for traffic service to the rapidly growing southeastern section of the planning area.

SR 1225 (CLARK'S ROAD) - This corridor along with NC 43, SR 1224 (Tuscarora Road) and SR 1243 (Saunders Lane and Ipock Road) is functioning as a US 17 Bypass of the planning area. Even after the US 17 Bypass is constructed Clark's Road will still be heavily traveled due to the projected industrial growth in the corridor. The relatively cheap and undeveloped land along with the close proximity of US 70 and US 17 Bypasses makes the area very attractive to development. A realignment is recommended at SR 1005 (Old US 70) with SR 1243 (Saunders Lane) so offset intersections can be eliminated on SR 1005, which will reduce travel time and accidents. A four lane divided section is recommended from SR 1224 (Tuscarora Road) to US 70, and a five lane section is recommended from US 70 to SR 1005 (Old US 70).

SR 1243 (SAUNDERS LANE AND IPOCK ROAD) - As mentioned above for Clark's Road this corridor is presently serving as a US 17 Bypass of the planning area. The intensity of development is expected to increase also after the US 17 Bypass is constructed but not to the degree of the Clark' Road (SR 1225) corridor. A realignment at NC 55 is recommended with Ipock Road and Saunders Lane so that the offset intersection can be eliminated on NC 55. A three lane section is recommended from SR 1225 (Clark's Road) to NC 55.

SR 1616 (OLD VANCEBORO ROAD) - This is a short section of the Saint Delight's Church Road (SR 1615) corridor that functions as a major arterial from the northeastern part of the County to US 17. It is recommended to be widened to four lanes.

NEW TAR LANDING DRIVE - This is a proposed major thoroughfare that will provide land access and traffic circulation as development expands in River Bend.

TRENT BOULEVARD (SR 1278) - This is a heavily traveled local thoroughfare that provides primary access to Trent Woods. The section from US 17 to Simmons Street will need multilanes to accommodate future traffic.

TUSCARORA ROAD (SR 1224) - After the US 17 Bypass is completed and current bypass type traffic shifts away from this facility there should be sufficient capacity to absorb future growth.

US 17 BUSINESS AND CLARENDON BOULEVARD - This is the second most heavily traveled traffic artery in the planning area besides US 70. The busiest section from Trent Road to Neuse Boulevard is already over capacity in some places. NCDOT has scheduled a widening project for that section in 1996. The City of New Bern has requested that as much of the grass median as possible should remain when the widening is completed. The construction of the US 17 Bypass and the Neuse River Bridge replacement will also reduce present and future traffic. The section from Neuse Boulevard to Front Street is covered in the Neuse Boulevard and Broad Street Sections. In Bridgeton, the entire corridor will still need to be widened even with construction of the US 17 Bypass, but there is sufficient right-of-way existing, and damage to existing structures along the corridor through Bridgeton should be minimal.

Minor Thoroughfares

The minor thoroughfare system serves the function of collecting local traffic from residential, commercial or industrial type areas and distributing it to the major thoroughfare system. They also may supplement the major thoroughfare system by carrying minor through traffic movements. Due to the land access type function, minor thoroughfares cannot accommodate large volumes of traffic. They are more of a collector-distributor system for the major thoroughfares.

The following is an alphabetical listing/description of the streets that compose the minor thoroughfare system on the Thoroughfare Plan. Appendix A has a more specific listing of each facility if more technical information is desired.

"A" STREET - It is located off National Avenue and is in the Riverside Historic District. Its function is to distribute local traffic in New Bern's Central Business District.

"B" STREET (Bridgeton) - This is the main local street for Bridgeton's Central Business District. Most sections are only eighteen feet wide and should be widened to at least twenty four feet.

BRIDGE STREET - Distributes local traffic in Bridgeton.

CHELSEA ROAD (SR 1200) - Allows for direct access to the proposed McCarthy Boulevard Extension.

CRAVEN STREET -Distributes local traffic in New Bern's Central Business District, and it is located in a National Register Historic District.

CYPRESS STREET - Distributes local traffic to and from New Bern's Central Business District.

ELIZABETH AVENUE AND PROPOSED EXTENSION - Collects residential traffic and carries minor local through traffic in New Bern. The proposed extension to Bosch Boulevard will service future development in the same capacity.

HALF MOON ROAD (SR 1600) - Provides for land access local through trips in the Bridgeton Area.

HIGHLAND AVENUE (SR 1216) - Collects residential traffic and carries minor local through traffic in Trent Woods.

HIGH SCHOOL ROAD - This is a proposed new facility that will help collect and distribute local traffic as development occurs in the western portion of the planning area.

HOWARD STREET - Distributes local traffic to and from New Bern's Central Business District.

NEW LAKEMERE DRIVE - Provides for residential access and internal traffic circulation in River Bend.

McCARTHY BOULEVARD/COMMERCE WAY AND EXTENSIONS - This is a proposed parallel facility to Glenburnie Avenue which will provide access and internal circulation for future development bounded by Glenburnie Road, US 70 Bypass, and Trent Boulevard. It is recommended to access this facility whenever possible with new development so Glenburnie Road's capacity will not further deteriorate.

METCALF STREET - Distributes local traffic in New Bern's Central Business District, and it is located in a National Historic District.

MIDDLE STREET - Distributes local traffic in New Bern's Central Business District, and it is located in a National Historic District.

OLD BRICK ROAD (SR 1307) - This facility has been listed by the State Historic Preservation Officer as being historically significant and a possible candidate for the National Register of Historic Places. Future traffic projections indicate a need for this roadway to be wider than its present eight feet. It is recommended that a new parallel two lane facility be constructed, and the Old Brick Road become a pedestrian walkway or bike path.

PINEWOOD DRIVE - Provides for residential access and internal traffic circulation in River Bend.

PIRATES ROAD - Provides for residential access and internal traffic circulation in River Bend.

PLANTATION DRIVE - Strictly a residential access facility for River Bend.

POLLOCK STREET - Functions as a minor crosstown route south of Broad Street through New Bern's historic district and the Central Business District.

RACE TRACK ROAD (SR 1220) - Collects residential traffic and carries minor local through traffic in New Bern.

RIVER ROAD (SR 1214) - Collects residential traffic and carries minor local through traffic in Trent Woods.

ROCKLEDGE ROAD - Provides for residential access and internal traffic circulation in River Bend.

SR 1113 (Old Cherry Point Road) - Functions as a land access and service road facility that parallels US 70. It allows US 70 to operate more efficiently by minimizing driveway access and local traffic on US 70.

SR 1143 (LITTLE ROAD) - Functions as a land access and local radial type collector for the southern part of the planning area. There are very few adequate thoroughfares in this area because it is part of the Croatan National Forest.

SR 1171 (HOWELL ROAD) - Collects residential and some commercial traffic and carries minor local through traffic through the James City Area.

SR 1433 (ANTIOCH ROAD) - Functions as a land access and local radial type collector for the Bridgeton Area.

SR 1917 (WILLIAMS STREET) - Collects residential and some commercial traffic and carries minor local through traffic through the James City Area.

STEEPLECHASE DRIVE (SR 1216) - Collects residential traffic and carries minor local through traffic in Trent Woods.

TRENT WOODS DRIVE (SR 1213) - Collects residential traffic and carries minor local through traffic in Trent Woods.

TRYON PALACE DRIVE - Distributes local traffic in New Bern's Central Business District.

Construction Improvements and Cost Estimates

Many considerations go into determining the actual staging and construction of a highway project. Political, social, environmental, and economic factors all have their influence. Each year the North Carolina Department of Transportation considers all these factors and prioritizes the State's transportation needs. That priority list determines the funding levels and construction schedules, and it is published as the Transportation Improvement Program (TIP).

In an effort to help the local officials in the New Bern Planning Area compare the relative value of various improvements in the Thoroughfare Plan, an assessment has been made of the benefits that can be expected from each project. These benefits can then be used as a guide to help prioritize local projects for submission to the Board of Transportation for scheduling consideration. Construction priority will vary depending on what criteria are considered and what weight is attached to the various criteria. Most people would agree that improvements to the major thoroughfare system and major traffic routes would be more important than minor thoroughfares where traffic volumes are lower. To be in the State's Transportation Improvement Program, a project must show favorable benefits relative to costs and should not be prohibitively expensive.

Three principal measures of benefits were used: road user cost savings, the potential for increased economic development resulting from the improvement, and the environmental impact, both positive and negative which may result. The first measure is an actual estimate of dollar savings, while the others are estimates of the probability of the resulting change.

Reduced road user costs should result from any roadway improvement, from a simple widening to the construction of a new roadway to relieve congested or unsafe conditions. Comparisons of the existing and proposed facility have been made in terms of vehicle operating costs, travel time cost, and accident costs. These user benefits are computed as total dollar savings over the 25 year design period using data such as project length, base year and design year traffic volumes, traffic speed, type of facility, and volume/capacity ratio.

The impact of a project on economic development potential is denoted as the probability that it will stimulate the economic development of an area by providing access to land with development potential and reducing transportation costs. It is a subjective estimate based on the knowledge of the proposed project, local development characteristics, and land development potential. The probability is rated on a scale from 0 (none) to 1.00 (excellent).

The environmental impact analysis considers the effect of a project on the physical, social/cultural, and economic environment. Many of these have been accounted for in evaluating the project with respect to user benefits, cost, and economic development potential. The environmental analysis evaluates the impact of the project on the following: (1) air quality, (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) parks and recreational facilities, (11) historic sites and landmarks, and (12) public health and safety. The summation of both positive and negative impact probabilities with respect to these factors provides a measure of the relative environmental impact of a project.

ENVIRONMENTAL CONSIDERATIONS

Physical Environment

Air Quality
Water Resources
Wildlife
Vegetation

Social and Cultural Environment

Housing
Neighborhoods
Noise
Educational Facilities
Churches
Parks and Recreational Facilities
Public Health and Safety
National Defense
Aesthetics

Economic Environment

Business
Employment
Economic Development
Public Utilities
Transportation Costs
Capital Costs
Operation and Maintenance Costs

Offsetting the benefits that would be derived from any project is the cost of its construction. A new facility, despite its projected benefits, might prove to be unjustified due to the excessive costs involved in construction. The highway costs estimated in this report are based on the average statewide construction costs for similar project types. An estimate of anticipated right-of-costs is also included.

Table 10 lists the major unfunded New Bern-Bridgeton-Trent Woods-River Bend Thoroughfare Plan projects with respect to user benefits, estimated costs, probability of economic development, and environmental impact. Refer to Figure 10 for a graphic illustration of each project.

Historic Sites

The City of New Bern, founded in 1710, is the second oldest city in North Carolina. It holds the honorable distinction of being the first colonial and state capital. Much of this historic past has been preserved throughout the planning area, and the continued preservation is important. There are approximately 200 sites of historic importance throughout the County, and about 50 within the planning area. The city of New Bern is designated as an historic district in the National Register of Historic Places.

Table 10 notes possible conflicts with the major unfunded recommendations in the area's Thoroughfare Plan. However, before any construction project is undertaken the State Historic Preservation Office should be consulted.

Air Quality

It has been found that use of the internal combustion engine in motor vehicles has caused approximately three-fourths of the carbon monoxide (CO), half the hydrocarbons (HC), and nearly half the nitrogen oxides (NO_x) in the atmosphere. Over the past twenty years there has been extensive research into methods to reduce these pollutants. The Federal Government passed an updated Air Quality Act in 1990 which set the highest standards on emissions for new automobiles to date.

The layout of the major street system will have an effect on air quality in the area. A street system that provides easy and direct movement between all sections of the city will reduce travel time and distances, thus reducing emissions. A thoroughfare plan designed to reduce congestion and stop-and-go driving conditions will also help reduce the concentration of pollutants in the air.

Table 11 shows a comparison of the total automobile emission pollutants in kilograms per day for the existing plus committed street system for the planning area and the adopted Thoroughfare Plan.

TABLE 10

NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND THOROUGHFARE PLAN

MAJOR UNFUNDED PROJECT COSTS, BENEFITS, AND PROBABLE IMPACTS

DESCRIPTION	LENGTH (mile)	CONST. COST ($1000)	ROW COST ($1000)	USER BENEFITS ($1000)	ECON. IMPACTS	ENVIRONMENTAL IMPACTS		
						POS	NEG	CONCERNS
Bosch Boulevard	3.90	5,000	200	61,000	0.50	0.40	0.30	wetlands
Chelsea Rd. Conn.	0.60	800	1000	3,900	0.20	0.30	0.20	wetlands house
Country Club Rd. Widening	1.90	1,600	0	900	0.10	0.30	0.10	cemetary golf course
East Front St & Trent River Brdg Widening	1.07	6,400	0	44,000	0.15	0.30	0.10	businesses church,park
Elizabeth Ave Ext	1.35	1,800	100	25,000	0.45	0.30	0.20	
First Street Widening	0.35	500	70	3,000	0.30	0.40	0.10	businesses historic
Glenburnie Road Widening	2.65	4,300	350	29,000	0.30	0.30	0.20	businesses school
Half Moon Rd/St Delight,s Church Rd/Old Vanceboro Widening	3.00	3,000	75	2,000	0.25	0.30	0.10	neighborhood historic
High School Road	5.10	5,100	150	42,000	0.50	0.30	0.30	wetlands
McCarthy Blvd/ Commerce Way	1.60	2,000	800	3,000	0.50	0.30	0	businesses
NC 43 Widening	3.00	4,400	0	22,000	0.35	0.30	0	historic
NC 55 Widening	3.25	4,300	190	6,700	0.35	0.30	0	historic
Old Brick Rd Widening	1.40	1,400	250	NA*	0.25	0.30	0.30	historic
Pembroke Rd Widening	1.75	2,300	0	4,800	0.15	0.30	0.10	busineses
Plantation Dr.	1.40	1,400	300	6,800	0.45	0.40	0	

*-NA Not Available, Widening From 8 Feet To 20 Feet Is Not Within The Parameters Of The Benefits Analysis Program Being Used.

TABLE 10 (CONTINUED)

NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND THOROUGHFARE PLAN

MAJOR UNFUNDED PROJECT COSTS, BENEFITS, AND PROBABLE IMPACTS

DESCRIPTION	LENGTH (mile)	CONST. COST ($1000)	ROW COST ($1000)	USER BENEFITS ($1000)	ECON. IMPACTS	ENVIRONMENTAL IMPACTS POS	NEG	CONCERNS
Simmons St Widening	1.10	1,300	100	9,600	0.15	0.30	0.10	neighborhood
Brices Crk. Conn.	0.65	1,200	100	10,000	0.15	0.30	0	airport
SR 1005(Old US70) Widening	1.30	1,700	50	1,400	0.30	0.30	0	historic
SR 1167(Williams Rd) Widening	0.95	1,250	50	500	0.20	0.30	0	
SR 1225(Clarks Rd) Widening	4.15	5,500	250	10,600	0.20	0.30	0.10	community historic
Trent Boulevard Widening	2.20	2,100	50	14,600	0.15	0.40	0	businesses cemetary
US 17 Business Widening	4.15	4,250	75	34,000	0.30	0.40	0	businesses
US 70 Bypass Widening	6.28	18,000*	0	385,000	0.25	0.40	0	businesses

*-Costs Do Not Include Any Interchanges

TABLE 11
2015 AIR QUALITY ANALYSIS OF ALTERNATIVE PLANS (KG/DAY)

Alter-native	Daily VMT (mi)	Carbon Monoxide (CO)	Nitric Oxides (NO_x)	Hydro-Carbons (HC)
E+C	2,384,564	63,524	4,935	5,192
TP	2,335,109	57,067	4,832	4,760

VIII. ADMINISTRATIVE CONTROLS AND IMPLEMENTATION TOOLS

State and Municipal Adoption of The Thoroughfare Plan

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provides that after development of a thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Department of Transportation to serve as the basis for future street and highway improvements. The General Statutes also require that, as part of the plan, the governing body of the municipality and Department of Transportation shall reach agreement on responsibilities for existing and proposed streets and highways included in the plan. Facilities which are designated a State responsibility will be constructed and maintained by the Division of Highways. Facilities which are designated a municipal responsibility will be constructed and maintained by the municipality.

After mutual plan adoption, the Department of Transportation will initiate negotiations leading to determining which of the existing and proposed thoroughfares will be a Department responsibility and which will be a municipal responsibility. Chapter 136, Article 3A, Section 136-66.1 of the General Statutes provides guidance in the delineation of responsibilities. In summary, these statutes provide that the Department of Transportation shall be responsible for those facilities that serve volumes of through traffic and traffic from outside the area to major business, industrial, governmental, and institutional destinations located inside the municipality. The municipality is responsible for those facilities that serve primarily internal travel.

Unless implementation is an integral part of the transportation planning process, the effort and expense associated with developing a plan is lost. To neglect the implementation process is a three-fold loss; the loss of the capital expenditures used in developing a plan, the opportunity cost of the capital expenditures, and more importantly the loss of the benefits that would accrue from an improved transportation system.

Administrative controls and implementation tools that can aid in the implementation process are generally available to municipalities through Federal and State Legislation. These controls and tools will be discussed in this chapter. They include: Subdivision Regulations, Zoning Ordinances, Official Maps, Urban Renewal, Capital Improvements Programs, and Development Reviews. Generally two issues play a major role in the implementation process, available finances and citizen involvement. Effective use of the controls and tools listed above are indicative of good planning and minimize the effects of limited finances and negative citizen reaction to specific elements of a plan. It is through good planning that maximum use is made of every available dollar and that citizen involvement and approval of the transportation plan is obtained.

Subdivision regulations

Subdivision regulations are locally adopted laws governing the process of converting raw land into building sites. From the planner's view, subdivision regulations are important at two distinct levels. First, they enable him to coordinate the otherwise unrelated plans of many individual developers. This process assures that provision is made for land development elements such as roadway right-of-way, parks, school sites, water lines, sewer outfalls, and so forth. Second, they enable him to control the internal design of each new subdivision so that its pattern of streets, lots, and other facilities will be safe, pleasant, and economical to maintain.

To be most effective, subdivision regulations and their administration must be closely coordinated with other local governmental policies and ordinances. Among the more important of these are the Comprehensive Growth Plan, Utilities Extension Master Plan, Cama Land Use Plan, and Thoroughfare Plan.

In practice, subdivision regulations can provide some very positive benefits such as requiring portions of major streets to be constructed in accordance with the Thoroughfare Plan, or requiring subdividers to provide for the dedication and/or reservation of rights-of-way in advance of construction. These practices reduce the overall cost of the plan by having some costs borne by developers. Recommended Subdivision Ordinances are included in Appendix B.

The Elizabeth Avenue Extension to Bosch Boulevard, or the Plantation Drive Extension in River Bend could benefit from developer cooperation through subdivision regulations.

Zoning Ordinances

Zoning is probably the single most commonly used legal device available for implementing a community's land-use plan. To paraphrase the U.S. Department of Commerce 1924 Standard Zoning Enabling Act, on which most present-day legislation is based, zoning may be defined as the division of a municipality (or other governmental unit) into districts, and the regulation within the districts of:

1. the height and bulk of buildings and other structures,
2. the area of a lot that may be occupied and the size of required open spaces,
3. the density of population, and
4. the use of buildings and land for trade, industry, residence, or other purposes.

The characteristic feature of the zoning ordinance that distinguishes it from most other regulations is that it differs from district to district, rather than being uniform throughout a city. Thus, a given area might be restricted to single-family residential development with minimum lot size requirements and setback provisions appropriate for development. In other areas, commercial or industrial development might be permitted, and regulations would be enacted to control such development. Building code provisions or sanitary regulations, on the other hand, normally apply to all buildings in a certain category regardless of where they may be situated within a city.

The zoning ordinance does not regulate the design of streets, utility installation, the reservation or dedication of parks, street rights-of-way, school sites, and related matters. These are controlled by subdivision regulations or possibly by use of an official map. The zoning ordinance should however, be carefully coordinated with these and other control devices.

Official Maps

The roadway corridor official map (or official map) is a document, adopted by the legislative body of the community, that pinpoints and preserves the location of proposed streets against encroachment. In effect, the official map serves notice on developers that the State or municipality intends to acquire certain specific property. The official map serves as a positive influence for sound development by reserving sites for public improvements in anticipation of actual need.

The NCDOT position is that it will limit the use of official maps to large scale, fully access controlled facilities planned for rapidly developing areas outside of municipal jurisdictions. For projects within municipal jurisdictions, official maps should be prepared and adopted by the local government. Municipalities may adopt official maps that extend beyond its extraterritorial jurisdiction with approval from the Board of County Commissioners.

It should be recognized that an official map places severe but temporary restrictions on private property rights. These restrictions are in the form of a prohibition, for up to three years, on the issuance of building permits or the approval of subdivisions on property lying within an official map alignment. The three year reservation period begins with the request for development approval. This authority should be used carefully and only in cases where less restrictive powers are found to be ineffective.

Requests for NCDOT to prepare and adopt an official map should be directed to the manager of the Program, Policy and Budget Branch. For cities contemplating the adoption of an official map, there are two ways in which the city may proceed. The first is to consider the official map statute as a stand-alone authority and use it as the basis for local adoption of an official map. Alternatively, the second approach is to adopt a local ordinance modeled after the statute, but modified to fit local circumstances and clarify the statute. Regardless of the approach taken, several procedural steps will need to be considered, such as establishing procedures for consideration of variance petitions.

Once the project has been selected and the alignment determined, maps must be prepared that are suitable for filing with the County Register of Deeds Office. The map should show the proposed alignment in sufficient detail to identify the functional design and the preliminary right-of-way boundaries. Since the purpose of the map is to show the effect on properties along the project path, the existing property boundaries should be identified. As an additional requirement, within one year of the adoption of an official map, work must begin on an environmental impact study or preliminary engineering.

It is important to recognize the risks inherent in the adoption of an official map prior to completing the environmental studies. Projects to be funded using any federal funds require the unbiased evaluation of alternate alignments. This means that other alternatives will be studied and compared to the protected alignment.[1]

The above information is only to serve as an introduction to official maps, and in no way provides the information necessary to begin development of an official map. The Program and Policy Branch of the North Carolina Department of Transportation is responsible for facilitating the adoption of Official Street Maps. Cities considering Official Street Map projects should contact this Branch for their "Guidelines for Municipalities Considering Adoption of Roadway Corridor Official Maps" at:

Programming, Policy and Budget Branch
NC Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611

Urban renewal

Urban renewal plays a minor role in the transportation planning implementation process in terms of scope and general influence. However, under the right circumstances, renewal programs can make significant contributions. Provisions of the New Housing Act of 1974 (as amended) call for the conservation of good areas, rehabilitation of declining areas, and clearance of slum areas. In the course of renewal, it is important to coordinate with the Thoroughfare Plan to see if additional set-back or dedication of right-of-way is needed.

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[1] "Guidelines for Municipalities Considering Adoption of Roadway Corridor Official Maps," prepared by NCDOT Program, Policy and Budget Branch.

Continued use of the urban renewal programs to improve the transportation system is encouraged. Changes that can be made under this program are generally not controversial or disruptive given the trauma of the clearance of a significant area.

Capital Improvement Programs

Capital programs are simply the coordination of planning and money. The capital improvements program, with respect to transportation, is a long range plan for the spending of money on street improvements, acquisition of rights-of-way and other improvements within the bounds of projected revenues. Municipal funds should be available for construction of street improvements which are a municipal responsibility; right-of-way cost sharing on facilities designated a Division of Highways responsibility; and advance purchase of right-of-way where such action is warranted.

Historically, cities and towns have depended, to a great degree, on Federal or State funding to solve their transportation problems. Chapter 136-Article 3A of the Road and Highway Laws of North Carolina clearly outlines the responsibilities and obligations of the various governmental bodies regarding highway improvements. North Carolina Highway Bill 1211, passed in 1988, limits the role of municipalities in right-of-way cost sharing for projects once they are programed in the NCDOT Transportation Improvement Program. Set-back regulations, right-of-way dedications and reservations play a major role in the ultimate cost of many facilities. Only in special cases will the municipality be able to enjoy the benefits of highway improvements without some form of investment.

Development Reviews

Driveway access to a State maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation prior to access being allowed. Any development expected to generate large volumes of traffic (ie., shopping centers, fast food restaurants, large industries, etc.) may be comprehensively studied by staff from the Traffic Engineering Branch, Statewide Planning Branch, and Roadway Design Branch of NCDOT. If done at an early stage, it is often possible to significantly improve the development's accessibility at minimal expense. Since the municipality is the first point of contact for developers, it is important that the municipality advise them of this review requirement and cooperate in the review process.

The McCarthy Boulevard Extension is a prime example of where the development review process could make a difference in the final alignment and cost of the project.

Other Funding Sources

1. Assess user impact fees to fund transportation projects. These fees, called "facility fees" in the legislation, are to be based upon "reasonable and uniform considerations of capital costs to be incurred by the city or town as a result of new construction. The facility fee must bear a direct relationship to additional or expanded public capital costs of the community service facilities to be rendered for the inhabitants, occupants of the new construction, or those associated with the development process."

2. Enact a bond issue to fund street improvements.

3. Continue to work with NCDOT to have local projects included in the Transportation Improvement Program (TIP).

4. Consider the possibility of specific projects qualifying for federal demonstration project funds.

5. Adopt a collector street plan that would assess buyer or property owners for street improvement.

6. Charge a special assessment for utilities. For example, water and sewer bills could be increased to cover the cost of street improvements.

APPENDICES

APPENDIX A

Typical Cross Sections

Typical cross sections recommended by the Statewide Planning Group are shown in Appendix A, Figure 1, and listed in Appendix A, Table 1.

Cross section "A" is illustrative for controlled access freeways. The 46 foot grassed median is the least desirable median width but there could be some variation from this depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I". Cross section "J" and "K" are usually recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter urban cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk further away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

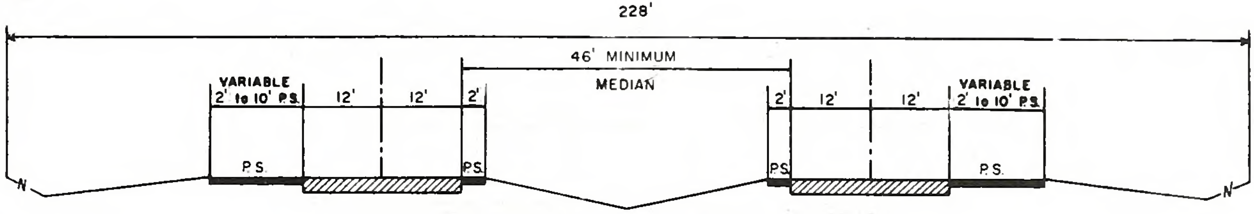
Rights-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require wither additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for design standards for bicycle facilities.

Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service and available right-of-way.

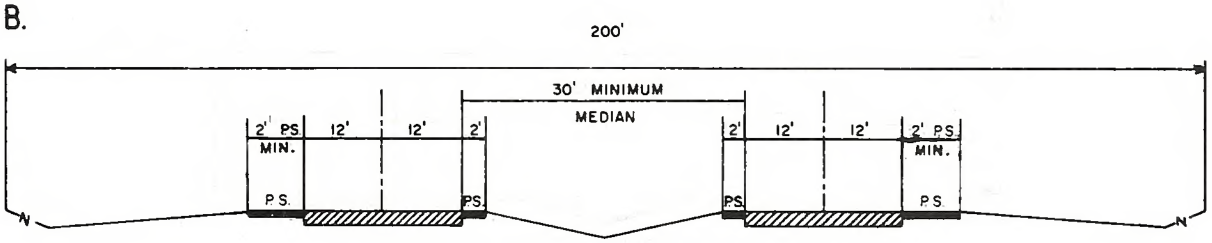
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



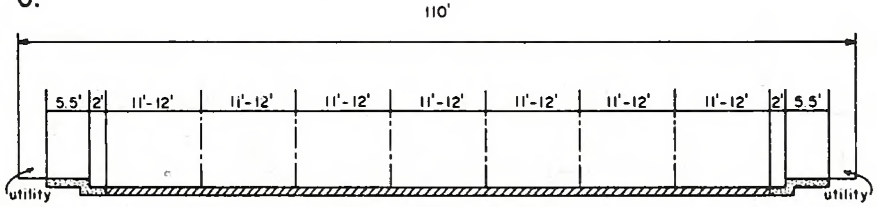
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



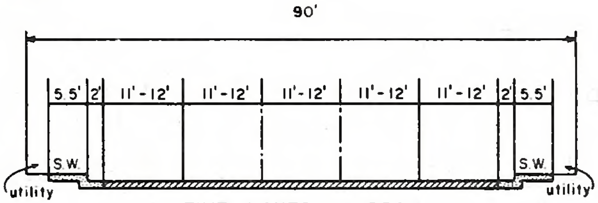
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



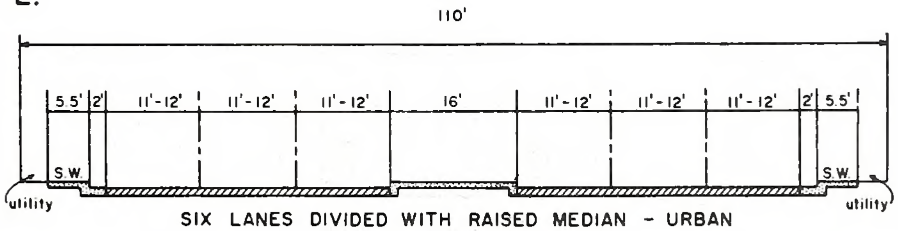
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

E.



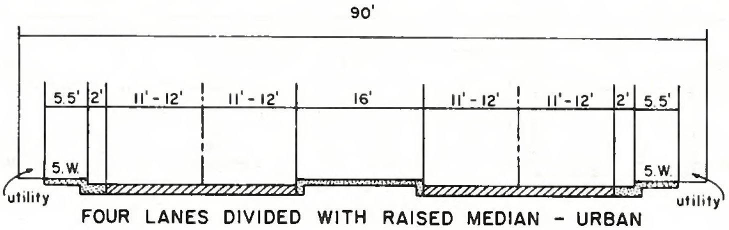
SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

FIGURE A-1

TYPICAL THOROUGHFARE CROSS SECTIONS

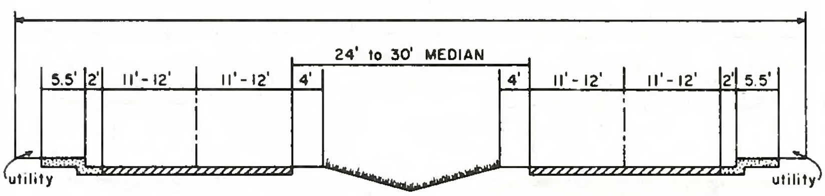
(CONTINUED)

F.



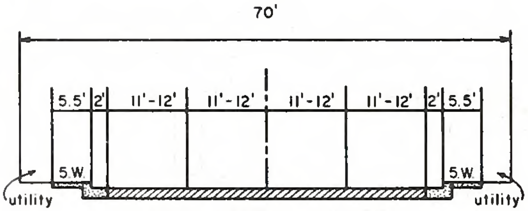
FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



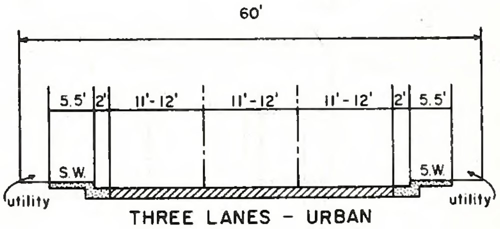
FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



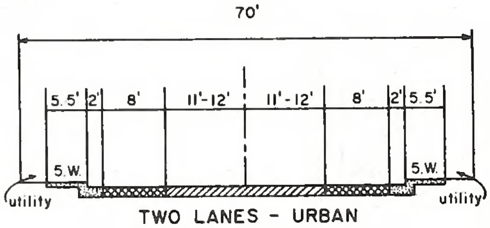
FOUR LANES - URBAN

I.



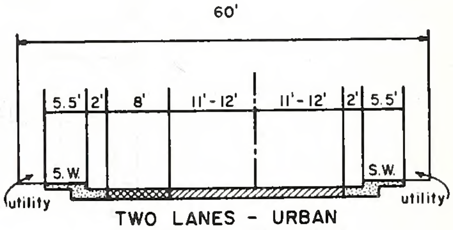
THREE LANES - URBAN

J.



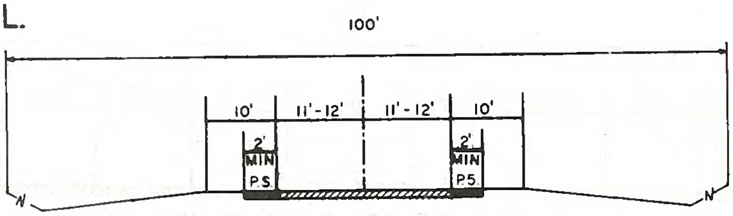
TWO LANES - URBAN
PARKING ON EACH SIDE

K.



TWO LANES - URBAN
PARKING ON ONE SIDE

L.

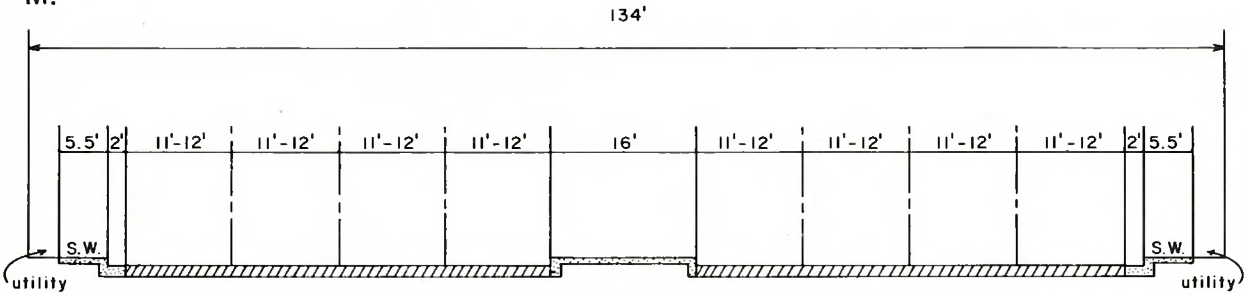


TWO LANES - RURAL

TYPICAL THOROUGHFARE CROSS SECTIONS

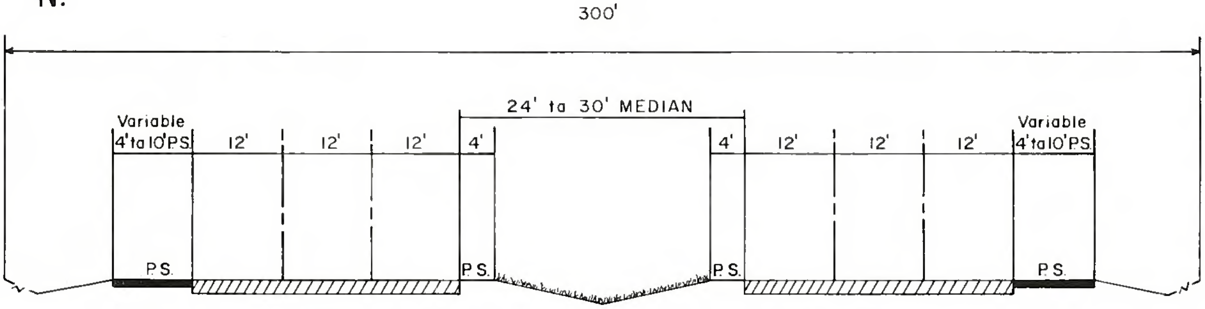
(CONTINUED)

M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - URBAN

N.



SIX LANES DIVIDED - RURAL FREEWAY
GRASS MEDIAN

APPENDIX A TABLE 1
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION			PRACTICAL CAPACITY			RECOMMENDED X - SECTION	
	DIST MI	RDWY FT	ROW FT	CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RDWAY FT	ROW FT
"A" STREET								
N. Craven St-National Ave	0.15	20	NA*	8000	500	1000	ADQ*	ADQ
ANTIOCH ROAD (SR 1433)								
See SR 1433								
"B" STREET (SR 1602)								
US 17-Railroad Tracks	0.60	18	60	6500	700	2500	24	ADQ
Railroad Tracks-W Hickory	0.30	35	60	13500	700	2500	ADQ	ADQ
W. Hickory St-Bridge St	0.50	18	60	6500	700	2500	24	ADQ
BOSCH BOULEVARD (SR 1304)								
NC43/55-Railroad Tracks	0.70	20	60	8000	--	9000	H*	70
Railroad Tracks-US70BYP	1.00	--*	--	(24000)	--	9000	H	70
US70BYP-High School Rd	0.60	--	--	(10500)	--	4000	L	70
High School Rd-US17	1.60	--	--	(10500)	--	6000	L	70
BRICE'S CREEK ROAD (SR1004)								
See SR 1004								
BRIDGE STREET (SR 1648)								
B Street-US 17	0.10	18	40	6500	500	1000	ADQ	ADQ
BROAD STREET (US 70 BUSINESS/NC 55)								
US17-First Street	0.50	62	80	28000	26000	33000	E	110
First St-Queen St	0.40	66	80	28000	24500	22000	ADQ	ADQ
Queen St-E. Front St	0.80	58	80	28000	16000	20000	ADQ	ADQ
CHELSEA ROAD (SR 1200)								
Trent Rd-Proposed Chelsea Connector (PCC)	0.60	26	60	10500	6000	4000	ADQ	ADQ
PCC-Country Club Rd	0.50	26	60	10500	6000	10000	I	ADQ
CHELSEA ROAD CONNECTOR								
Old Chelsea Rd-Trent Rd	0.60	--	--	(16000)	--	6000	I	60
CLARENDON BOULEVARD (US 17)								
See US 17 BUSINESS								

*- "ADQ" Adequate
*- "H" Typical Cross Section, Figure A-1
*- "NA" Not Available
*- "--" Proposed Road

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION			PRACTICAL CAPACITY	1989	2015	RECOMMENDED X - SECTION	
	DIST MI	RDWY FT	ROW FT	CURRENT (FUTURE)	ADTS	ADTS	RDWAY FT	ROW FT
CLARK'S ROAD (SR 1225)								
See SR 1225								
COUNTRY CLUB ROAD (SR 1200)								
Chelsea Rd-Steeplechase	1.90	24	60	10500	3000	7000	I*	ADQ*
CRAVEN STREET								
Tryon Palace Dr-Queen St	1.05	33	NA*	12000	4800	6000	ADQ	ADQ
Queen St-"A" St	1.10	33	NA	12000	2100	4000	ADQ	ADQ
CYPRESS STREET								
Howard St-George St	0.05	18	NA	6500	500	800	20	ADQ
EAST FRONT STREET (US 70 BUSINESS & TRENT RIVER BRIDGE)								
Broad St-Tryon Palace Dr	0.22	44	100	20000	17000	25000	D	ADQ
Tryon Palace Dr-SR1004	0.50	28	NA	14000	15200	25000	H	ADQ
SR1004-US70	0.35	24	200	10500	12000	20000	H	ADQ
ELIZABETH AVENUE AND PROPOSED EXTENSION								
Glenburnie Rd-Race Track	0.50	36	NA	16000	2000	4000	ADQ	ADQ
Race Track Rd-Bosch Blvd	1.35	--*	--	(16000)	--	7000	I	70
FIRST STREET (SR 1200)								
Pembroke Rd-Queen St	0.10	47	60	20000	9000	18000	G	100
Queen St-Broad St	0.25	47	60	20000	4000	11000	G	100
GEORGE STREET (SR 1403)								
Pollock St-Broad St	0.10	45	NA	20000	2000	3900	ADQ	ADQ
Broad St-Queen St	0.20	45	NA	20000	1000	1500	ADQ	ADQ
Queen St-Cypress St	0.40	49	NA	22000	4600	6000	ADQ	ADQ
GLENBURNIE ROAD (NC 43/SR 1309/SR 1402)								
Trent Rd-US17	0.35	51	70	28000	6400	8000	ADQ	ADQ
US17-McCarthy Blvd	0.70	51	80	28000	16000	18000	ADQ	ADQ
McCarthy Blvd-US70	0.40	51	80	28000	18000	34000	C	110
US70-Neuse Blvd	1.10	51	NA	28000	22000	34000	C	110
Neuse Blvd-Oaks Rd	1.15	24	60	10500	6300	19000	H	70

*- "ADQ" Adequate
*- "I" Typical Cross Section, Figure A-1
*- "NA" Not Available
*- "--" Proposed Road

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

	EXISTING X - SECTION			PRACTICAL CAPACITY			RECOMMENDED X - SECTION	
FACILITY & SECTION	DIST MI	RDWY FT	ROW FT	CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RDWAY FT	ROW FT
HALF MOON ROAD (SR 1600)								
SR1616-SR1615	0.35	18	60	6500	3100	9000	H*	70
SR1615-NC55	1.75	18	60	6500	1200	3000	ADQ*	ADQ
HIGHLAND AVENUE (SR 1216)								
Trent Rd-Steeplechase Dr	0.60	19	60	6500	3400	5000	L	ADQ
HIGH SCHOOL ROAD								
US17-BOSCH BLVD	1.90	--*	--	(10500)	--	2000	L	70
BOSCH BLVD-US17BYP	1.60	--	--	(10500)	--	4000	L	70
US17BYP-SR1225	1.60	--	--	(10500)	--	6000	L	70
HOWARD STREET								
Metcalf St-Cypress St	0.20	18	NA*	6500	500	800	20	ADQ
HOWELL ROAD (SR 1171)								
See SR 1171								
IPOCK LANE (SR 1243)								
See SR 1243								
LAKEMERE DRIVE								
Pinewood Dr-Tar Landing	0.40	--	--	(10500)	NA	1500	24	60
LITTLE ROAD (SR 1143)								
See SR 1143								
McCARTHY BOULEVARD/COMMERCE WAY & EXTENSIONS								
Glenburnie Rd-For 0.35 Mi	0.35	48	80	20000	NA	10000	G	ADQ
From 0.35 Mi-US17	0.40	--	--	(28000)	--	12000	G	100
US17-For 0.25 Mi.	0.25	48	80	20000	NA	2000	ADQ	ADQ
From 0.25-Trent Blvd.	0.20	--	--	(10500)	--	2000	L	100
METCALF STREET								
Tryon Palace Dr-Queen St	0.45	32	NA	12000	2000	4000	ADQ	ADQ
Queen St-Howard St	0.10	31	NA	12000	500	800	ADQ	ADQ

*- "ADQ" Adequate
*- "H" Typical Cross Section, Figure A-1
*- "NA" Not Available
*- "--" Proposed Road

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RECOMMENDED X - SECTION RDWAY FT	ROW FT
MIDDLE STREET								
Tryon Palace Dr-N. Craven	0.50	33	NA*	12000	2500	4500	ADQ*	ADQ
NATIONAL AVENUE (SR 1403)								
Cypress St-"A" St	0.20	29	NA	12000	5000	7000	ADQ	ADQ
"A" St-Smith Creek	0.75	29	NA	12000	7700	8500	ADQ	ADQ
NC 43								
NW PAB* -SR1419	1.50	29	120	12000	9000	9000	ADQ	ADQ
SR1419-NC55	1.40	29	120	12000	10500	11000	G	ADQ
NC55-Glenburnie Rd.	1.60	62	NA	28000	18500	30000	E	110
(Cont'd on Glenburnie Rd.)								
NC 55								
NW PAB -SR1243	0.50	20	60	8000	2200	3000	ADQ	ADQ
SR1243-SR1005	1.25	20	60	8000	2300	10000	G	120
SR1005-NC43	2.00	24	60	10500	5300	17000	G	120
(See NC43, Neuse Blvd, & Broad St)								
New John Lawson Bridge in Bridgeton-SR1600	1.20	22	100	11000	10400	28000	D	ADQ
SR1600-NE PAB	0.65	22	100	9500	8500	17000	G	120
NEUSE BOULEVARD (US 70 BUSINESS/NC 55)								
Glenburnie Rd-Simmons St	0.95	62	NA	28000	20500	27000	ADQ	ADQ
Simmons St-US17	0.65	62	NA	28000	17300	25000	ADQ	ADQ
NEW NEUSE RIVER BRIDGE								
US70-NC55 & US17	3.20	--*	--	56000	--	56000	H	--
OAKS ROAD (SR 1403)								
Smith Creek-Simmons St	0.60	22	NA	9500	7700	9500	I	60
Simmons St-Glenburnie Rd	0.90	22	NA	9500	6500	9100	I	60
OLD BRICK ROAD (SR 1307)								
US17-Shoreline Dr	1.10	8	NA	500	NA	500	20	60
Shoreline Dr-US17	0.30	8	NA	500	NA	300	20	60

*- "ADQ" Adequate
*- "I" Typical Cross Section, Figure A-1
*- "NA" Not Available
*- "--" Proposed Road
*- "PAB" Planning Area Boundary

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION			PRACTICAL CAPACITY			RECOMMENDED X - SECTION	
	DIST MI	RDWY FT	ROW FT	CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RDWAY FT	ROW FT
OLD CHERRY POINT ROAD (SR 1113)								
See SR 1113								
OLD US 70								
See SR 1005								
OLD VANCEBORO ROAD (SR 1616)								
See SR 1616								
PEMBROKE ROAD (SR 1200)								
Steeplechase Dr-For 1 Mi	1.00	24	60	10500	4100	9000	I*	ADQ*
From 1 Mi-For 0.2 Mi.	0.20	24	100	10500	4100	9000	I	ADQ
From 0.20 Mi-US70 Byp.	0.25	30	200	12000	4100	9000	I	ADQ
US70-First St	0.30	47	200	20000	12000	20000	G	ADQ
PINEWOOD DRIVE								
Rockledge Rd-Plantation	0.35	20	50	8000	NA*	500	ADQ	ADQ
Plantation Dr-Old Brick	0.70	--*	--	(10500)	--	1000	ADQ	ADQ
PIRATES ROAD								
Shoreline Dr-US17	0.85	20	60	8000	NA	2000	ADQ	ADQ
PLANTATION DRIVE								
US17-Tar Landing Dr	1.20	--	--	(10500)	--	5000	L	60
Tar Landing-Plantation Dr	0.20	--	--	(10500)	--	3000	L	60
Plantation Dr-Shoreline	0.60	18	60	6500	NA	3000	L	60
Shoreline Dr-Creek	0.20	2LD*	60	6000	NA	800	ADQ	ADQ
Creek-GangPlank Rd	0.90	20	60	8000	NA	800	ADQ	ADQ
GangPlank Rd-Shoreline Dr	0.50	2LD	60	6000	NA	800	ADQ	ADQ
POLLOCK STREET								
First St-Queen St	0.30	40	NA	20000	6000	8000	ADQ	ADQ
Queen St-George St	0.80	36	NA	18000	1100	4000	ADQ	ADQ
George St-Front St	0.85	29	NA	12000	1100	2000	ADQ	ADQ
RACE TRACK ROAD (SR 1220)								
Elizabeth Ave-Neuse Blvd	0.90	18	60	6500	2000	4500	24	ADQ

*- "ADQ" Adequate
*- "I" Typical Cross Section, Figure A-1
*- "NA" Not Available
*- "--" Proposed Road
*- "2LD" Two Lanes Divided

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	EXISTING X - SECTION RDWY FT	EXISTING X - SECTION ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RECOMMENDED X - SECTION RDWAY FT	RECOMMENDED X - SECTION ROW FT
RIVER ROAD (SR 1214)								
Trent Woods Dr-US17	1.10	18	60	6500	1000	2500	ADQ*	ADQ
ROCKLEDGE ROAD								
Shoreline Dr-Shoreline Dr	0.60	18	60	6500	NA*	600	ADQ	ADQ
SAINT DELIGHT'S CHURCH ROAD (SR 1615)								
SR1600-SR1600 At PAB*	0.65	18	100	6500	1900	9000	H*	ADQ
SAUNDERS LANE (SR 1243)								
See SR 1243								
SHORELINE DRIVE								
US17-Plantation Dr	0.80	24	60	10500	6600	9500	I	60
Plantation Dr-Plantation	0.70	24	60	10500	2000	3000	ADQ	ADQ
Plantation Dr-Rockledge	1.00	18	60	6500	NA	600	ADQ	ADQ
SIMMONS STREET (SR 1215)								
Trent Blvd-US17	0.25	47	60	20000	7400	14500	ADQ	ADQ
US17-Neuse Blvd	0.65	47	60	20000	13000	22000	H	70
Neuse Blvd-Railroad Track	0.60	47	60	20000	8000	13000	ADQ	ADQ
Railroad Tracks-Oaks Rd	0.45	26	60	10500	5000	12000	H	70
SR 1004 (BRICE'S CREEK RD)								
SW PAB -SR1144	1.10	18	60	6500	540	2000	ADQ	ADQ
SR1144-SR1143	1.30	18	60	6500	1800	4000	24	ADQ
SR1143-SR1167 Connector	1.10	22	60	9500	2600	14000	G	120
(Gap, Section Not On Plan)								
SR1171-Trent River Bridge	0.53	22	100	9500	3200	12000	H	ADQ
SR 1004 (BRICE'S CREEK RD/SR1167 (WILLIAMS RD) CONNECTOR								
SR1143-SR1167	0.65	--*	--	(28000)	--	12000	G	120
SR 1005 (OLD US 70)								
West PAB -SR1225	0.90	22	100	9500	1000	5000	ADQ	ADQ
SR1225-NC55	1.30	22	100	9500	2100	11000	G	120

*- "PAB" Planning Area Boundary
*- "ADQ" Adequate
*- "H" Typical Cross Section, Figure A-1
*- "--" Proposed Road
*- "NA" Not Available

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION			PRACTICAL CAPACITY			RECOMMENDED X - SECTION	
	DIST MI	RDWY FT	ROW FT	CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RDWAY FT	ROW FT
SR 1113 (OLD CHERRY POINT ROAD)								
PAB* - SR1124	1.30	24	100	10500	3500	6500	ADQ*	ADQ
SR1124-SR1131	0.65	24	100	10500	5000	10000	H*	ADQ
SR1131-SR1917	1.00	24	100	10500	2000	4000	ADQ	ADQ
SR 1143 (LITTLE ROAD)								
PAB - SR1144	0.50	20	60	8000	100	500	ADQ	ADQ
SR1144-SR1004	1.20	20	60	8000	1000	3000	ADQ	ADQ
SR 1167 (WILLIAMS ROAD)								
SR1167 Connector-SR1171	0.40	22	60	9500	2000	12000	G	120
SR1171-US70	0.55	24	100	10500	2000	4000	G	120
SR 1171 (HOWELL ROAD)								
SR1004-SR1167	0.65	22	60	9500	2000	8000	H	70
SR 1224 (TUSCARORA ROAD)								
See Tuscarora Road								
SR 1225 (CLARK'S RD)								
SR1224-US70	3.20	20	60	8000	1600	10000	G	120
US70-Railroad Tracks	0.75	20	60	8000	3200	22000	D	90
Railroad Tracks-SR1005	0.20	--*	--	(28000)	--	22000	D	90
SR 1243 (SAUNDERS LANE/IPOCK LANE)								
SR1005-NC55	1.30	24	60	10500	1800	8400	I	70
NC55-NC43	1.60	24	60	10500	1900	2500	ADQ	ADQ
SR 1433 (ANTIOCH ROAD)								
PAB - US17	1.55	18	60	6500	1500	5000	24	ADQ
SR 1616 (OLD VANCEBORO RD)								
US 17-SR1600	0.25	18	60	6500	2800	14800	H	70
SR 1917 (WIllIAMS STREET)								
US70-SR1113	0.10	18	60	6000	1600	3000	ADQ	ADQ
STEEPLECHASE DRIVE (SR 1216)								
Pembroke Rd-Highland Ave	0.75	19	60	6500	3200	4500	L	ADQ

*- "PAB" Planning Area Boundary
*- "ADQ" Adequate
*- "H" Typical Cross Section, Figure A-1
*- "--" Proposed Road

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION			PRACTICAL CAPACITY			RECOMMENDED X - SECTION	
	DIST MI	RDWY FT	ROW FT	CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RDWAY FT	ROW FT
TAR LANDING DRIVE								
Plantation Dr-Lakemere Dr	0.25	--	--	(10500)	--	1500	24	60
Lakemere Dr-Old Brick Rd	0.35	--	--	(10500)	--	3000	24	60
Old Brick Rd-US17	0.15	--	--	(10500)	--	3500	24	60
TRENT BOULEVARD (SR 1278)								
US17-Chelsea Rd	0.90	24	60	10500	3900	8000	I*	ADQ*
Chelsea Rd-Simmons St	1.30	24	60	10500	8000	14000	H	70
Simmons St-First St	1.25	40	60	20000	6400	8500	ADQ	ADQ
TRENT WOODS DRIVE (SR 1213)								
River Rd-Chelsea Rd	1.20	18	60	6500	3000	5500	L	ADQ
TRYON PALACE DRIVE								
Front St-Metcalf St	0.55	42	NA*	20000	1000	3000	ADQ	ADQ
TUSCARORA ROAD (SR 1224)								
US17-SR1225	2.30	20	60	8000	1600	5000	ADQ	ADQ
SR1225-PAB*	0.80	20	60	8000	700	3000	ADQ	ADQ
US 17BUS/CLARENDON BLVD.								
SW PAB -Tar Landing Dr.	4.21	150	48E*	40000	9500	18000	ADQ	ADQ
Tar Landing-Shoreline Dr.	0.62	200	48E	40000	9500	16000	ADQ	ADQ
Shoreline Dr-Trent Blvd.	2.82	200	48E	37000	14000	27000	ADQ	ADQ
Trent Blvd.-Glenburnie Rd	0.65	200	48E	34000	21000	21000	E	ADQ
Glenburnie Rd-Simmons St.	1.41	200	48E	31000	28000	34000	E	ADQ
Simmons St.-Neuse Blvd.	0.76	200	48E	28000	13300	17000	E	ADQ
(See Neuse Blvd.& Broad St For Sections To Old John Lawson Bridge)								
From New John Lawson Bridge in Bridgeton-SR1616(Old Vanceboro Rd)	1.65	150	22	9500	10600	24000	D	ADQ
SR1616-SR1433	1.05	150	22	9500	8700	18000	D	ADQ
SR1433-PAB	1.45	150	24	10500	6500	13000	B	200

*- "PAB" Planning Area Boundary
*- "48E" 4 Laness Divided, Expressway
*- "ADQ" Adequate
*- "I" Typical Cross Section, Figure A-1
*- "--" Proposed Road
*- "NA" Not Available

APPENDIX A TABLE 1 (CONTINUED)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1989 ADTS	2015 ADTS	RECOMMENDED X - SECTION RDWAY FT	ROW FT
US 17 BYPASS								
US 17 BUS. SW-New High School Rd.	3.70	--*	--	(54000)	--	8000	A*	350
New HS Rd-US 70 Byp.	1.35	--	--	(54000)	--	20000	A	350
US 70 Byp.-PAB*	3.00	--	--	(54000)	--	24000	A	350
US 70 Bypass								
West PAB - SR1225	0.70	370	48F*	54000	11000	18000	ADQ*	ADQ
SR1225-US 17 Bypass	1.00	370	48F	54000	9800	33000	ADQ	ADQ
US 17 Byp.-Bosch Blvd.	1.50	370	48F	54000	9800	45000	ADQ	ADQ
Bosch Blvd.-Glenburnie Rd	1.85	370	48F	54000	9800	36000	ADQ	ADQ
Glenburnie Rd-US 17	0.94	370	48F	54000	19200	45000	ADQ	ADQ
US 17-Pembroke Rd.	1.58	320	48F	54000	22800	62000	N	ADQ
Pembroke Rd-New John Lawson Bridge	1.35	320	48F	54000	28400	81000	N	ADQ
New Bridge-AirPort Rd.	1.35	260	48E*	28000	17800	62000	M	ADQ
Airport Rd-PAB	2.00	260	48E	34000	28250	45000	M	ADQ
WILLIAMS ROAD (SR1167)								
See SR 1167								
WILLIAMS STREET (SR 1917)								
See SR 1917								

*- "PAB" Planning Area Boundary
*- "48E" 4 Laness Divided, Expressway
*- "ADQ" Adequate
*- "A" Typical Cross Section, Figure A-1
*- "--" Proposed Road
*- "48F" Lanes Divided, Freeway

APPENDIX B

RECOMMENDED SUBDIVISION ORDINANCES
Definitions and Design Standards

Definitions

I. Streets and Roads

A. Rural Roads

1. Principal Arterial - A rural link in a network of continuous routes serving corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural link in a network joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement.

3. Major Collector - A road which serves major intracounty travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and links the locally important traffic generators with their rural hinterland.

5. Local Road - A local road that serves primarily to provide access to adjacent land and for travel over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of interstate, other freeway, expressway, or parkway links, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares are important streets in the city system and perform the function of collecting traffic from the local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating a minor through traffic movement and may also serve abutting property.

3. Local Streets - A local street is any link not on a higher-order urban system and serves primarily to provide direct access to abutting land and access to higher systems.

C. Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided muti-lane roadways designed to carry large volumes of traffic at relatively high speeds. A freeway is a divided highway providing for continuous flow of vehicles with no direct access to abutting property or streets and with access to selected crossroads provided via connecting ramps. An expressway is a divided highway with full or partial control of access and generally with grade separations at major intersections. A parkway is a highway for noncommercial traffic, with full or partial control of access, and usually located within a park or a ribbon of park-like development.

2. Residential Collector Street - A local access street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having but one end open to traffic and the other end being permanently terminated and a vehicular turn around provided.

5. Frontage Road - A local street or road that is parallel to a full or partial access controlled facility and functions to provide access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot - A portion of a subdivision, or any other parcel of land, intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

1. Corner Lot - A lot abutting upon two streets at their intersection.

2. Double-Frontage Lot - A continuous (through) lot which is accessible from both of the parallel streets upon which it fronts.

3. Reverse-Frontage Lot - A continuous (through) lot which is accessible from only one of the parallel streets upon which it fronts.

III. Subdivision

A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, whether immediate or future, for sale or building development, and all divisions of land involving the dedication of a new street or a change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than five acres where no street right-of-way dedication is involved; (3) the public acquisition by purchase of strips of land for the widening or opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. Since a transfer of property is involved, the dedication is made by written instrument and is completed with an acceptance.

D. Reservation - A reservation of land does not involve any transfer of property rights. It simply constitutes an obligation to keep property free from development for a stated period of time.

Design Standards

The design of all streets and roads within an Urban Area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway and Transportation Officials (AASHTO) manuals[1].

The provision of street rights-of-way shall conform and meet the requirements of the Thoroughfare Plan for the Urban Area as adopted by the local bodies and the North Carolina Department of Transportation.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

The urban planning area shall consist of that area within the urban planning boundary as depicted on the mutually adopted Thoroughfare Plan. The rural planning area shall be that area outside the urban planning boundary.

Right-of-Way

Right-of-way widths shall not be less than those shown in table B-1 and shall apply except in those cases where right-of-way requirements have been specifically set out in the Thoroughfare Plan.

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. In all cases in which right-of-way is sought for an access controlled facility, the subdivider will only be required to make a reservation.

A partial width right-of-way, not less than sixty (60) feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

Street Widths

Street widths for street and road classifications other than local shall be as required by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential
    Curb and gutter section - 26 feet, to face of curb

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[1] The design standards listed herein are only to be used as a guide. All designs should comply with such guides as A Policy on Geometric Design of Highways and Streets, 1984 (Green Book), AASHTO, Washington, D.C.

of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight

Table B-4 Sight Distance

	Design Speed (mph)				
	20	30	40	50	60
Stopping Sight Distance					
Min. Distance, Ft.	150	200	275	350	475
Desirable Distance Ft.	150	200	300	450	650
Min. K* Value For:					
Minimum Crest Curve	16	28	55	85	160
Des. Crest Curve	16	28	65	145	300
Minimum Sag Curve	24	35	55	75	105
Des. Sag Curve	24	35	60	100	155
Passing Sight Distance -					
Minimum Passing Distance Feet (2 lane)	800	1100	1500	1800	2100
Minimum K[1] Value for Crest Vertical Curve		365	686	985	1340

1 K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide minimum sight distance.

Table B-5 Superelevation Table

Design Speed MPH	Max. e[1]	Minimum Radius Feet	Maximum Degree of Curve Degrees
20	.04	125	45.0
30	.04	300	19.0
40	.04	560	10.0
50	.04	925	6.0
60	.04	1410	4.0
20	.06	115	50.0
30	.06	275	21.0
40	.06	510	11.5
50	.06	830	7.0
60	.06	1260	4.5
20	.08	110	53.5
30	.08	250	23.0
40	.08	460	12.5
50	.08	760	7.5
60	.08	1140	5.0

[1] e = rate of roadway superelevation, foot per foot

triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

Off-set intersections are to be avoided unless exception is granted by the Division of Highways for intersections involving the State Highway System, or the Planning Board for intersections involving only the municipal street system. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between surveyed centerlines.

Cul-de-sacs

Cul-de-sacs, unless exception is granted by the local planning board, shall not be more than five hundred feed in length. The distance from the edge of pavement on the vehicular turn-around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn-around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

Alleys

Alleys should be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances. The width of an alley shall be at least twenty feet. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn-around facilities at the dead-end as may be approved by the Planning Board.

Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the nearest District Engineer of the Division of Highways.

Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of thirty feet from the edge of pavement. On streets with curb and gutter, utility poles should be set back a minimum distance of six feet from the face of curb.

Wheel Chair Ramps

In accordance with Chapter 136, Article 2A, ss136-44.14, all street curbs in North Carolina being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason after September 1, 1973, shall provide wheelchair ramps for the physically handicapped at all intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow. Wheelchair ramps and depressed curbs shall be constructed in accordance with details contained in the Department of Transportation, Division of Highways, Publication entitled, "Guidelines, Curb Cuts and Ramps for Handicapped Persons".

Horizontal Width on Bridge Decks

The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

Shoulder Section Approach

Under 800 ADT During Design Year	Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.
800-2000 ADT During Design Year	Minimum 34 feet width face to face of parapets or tails or pavement width plus 12 feet, whichever is greater.
Over 2000 ADT During Design Year	Minimum 40 feet, Desirable 44 feet width face to face of parapets or rails

Curbs and Gutter Approach

Under 800 ADT During Design Year	Minimum 24 feet face to face of curbs.
Over 800 ADT During Design Year	Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1′6" minimum, or greater if sidewalks are required.

The clear roadway widths for new and reconstructed bridges having four or more lanes undivided two-way traffic should be as follows:

Shoulder Section Approach
Width of approach pavement plus width of usable shoulders on the approach left and right. Minimum 8′, Desirable 10′

Curb and Gutter Approach Width of approach pavement measured face to face of curbs.

APPENDIX C

TRAVEL FORECASTING MODELS

1989 Travel

Travel forecasting models were developed and calibrated for the area using 1989 socio-economic data and traffic counts. The techniques employed are in accordance with North Carolina's urban travel forecasting procedures. The 1975 New Bern external origins and destinations traffic surveys were used to assist in the development of the 1989 through and external-internal trip tables. However, due to the significant changes that have occurred in the road system (namely US-70 Bypass), and the expansion of the planning area, adjustments had to be made in the through travel.

Since the area was last modeled for the 1978 study the planning area has been enlarged. The planning area for this study is shown in Figure 3 and is broken down into 80 traffic analysis zones (1-80) and 18 external stations (81-98). These zones segregate, as far as possible, the area into homogeneous land uses to aid in the development and calibration of the travel forecasting models and to aid in the forecasting of the 2015 socio-economic data (land uses).

Several improvements have been made in North Carolina's travel forecasting procedures since the earlier New Bern study. Our housing rating procedure was expanded from 3 to 5 main categories of economic conditions with an extra or 6th condition for special housing. In this study the 6th condition was not used.

Internal trip attractions were derived synthetically by borrowing the regression equation from the Hickory Study and calibrating it for this new planning area. The experience that North Carolina has gained in travel modeling since the early sixties has given us the confidence that we can "borrow" travel parameters from other data bases and calibrate them to fit a new urban area.

Average weekday trip productions were estimated on a zonal basis in three categories: (1) trips produced by dwelling units, (2) trips produced by commercially used autos, and (3) trips produced by trucks. The trip generation rates for each category were estimated using rates derived from statewide averages and adjusted to reflect more closely the housing and trip generation characteristics of the area. All rates were adjusted for accuracy as determined by screenline checks. See Table C-1 for the calibrated 1989 and estimated 2015 generations rates.

An important part of the model calibrations are screenlines. A screenline is an imaginary line drawn across a part or the entire planning area. Counts are taken at every street that crosses this line and the total volume of traffic is determined. This volume can then be compared to a similar volume obtained from the synthetic modeling process. This accuracy check will indicate if the total amount of travel on the network is correct. Screenlines for the New Bern-Bridgeton-Trent Woods-River Bend Planning Area are shown on Figure 3. Final model calibration reflected the following screenline accuracy checks:

(1) Screenline A - 92 % (east-west screenline south of US 70)
(2) Screenline B - 88 % (east-west screenline north of US 70 and north-south through New Bern to Bridgeton)
(3) Screenline C - 83 % (east west screenline south of US 17 to US 70 Bypass)
(4) Screenline D - 94 % (Trent River Bridge screenline)
(5) Screenline E - 101% (Neuse River Bridge screenline)
(6) Screenline F - 93 % (east-west screenline north of US 70 from screenline B to screenline D)

The final analysis showed that the total trips modeled in the planning area crossing all the screenlines were 576,610 and the actual trips counted at the screenlines were 560,482 (103%).

The total trips generated by dwelling units, commercial autos, and trucks were summed to produce total internally generated trips. They were reduced by a reduction factor of 0.88 to account for trips made by vehicles garaged inside the planning area but with destinations outside the planning area (these trips are included in the external station counts). The adjusted internal travel was separated into three purposes: home-based work (HBW) 25 %, home-based other (HBO) 48 %, and non home-based (NHB) 27 %. Added to these internally generated trips are a component of internal trips that are generated by vehicles garaged outside the planning area. They are called secondary NHB trips and they totaled 26,000 in 1989. See page C-5 for their development. These trips are added to the internally produced NHB trips and distributed to each zone based on each zone's relative attractiveness as determined by the internal regression equation. Zonal productions and attractions were developed using a program developed by the North Carolina DOT called IDS (See Table C-2 for 1989 IDS.)

The HBW attraction factors were taken to be the total employment within the zone. Factors for HBO, NHB, and external-internal (EXT-INT) purposes were developed using the multiple regression equation "borrowed" from the Hickory Study. The regression analysis uses zonal employment and housing as the independent variables and computes an estimate of trips attracted as the dependent variable. One special variable was added to the equation, for large, concentrated shopping zones to increase their attractiveness. This was done to make the modeled trips going into and out these zones more in line with accepted trip generation rates[1] and local experience. The final equations used are shown in Table C-4.

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[1] From ITE Trip Generation, Third Edition

Traffic counts were taken at all major roads where they entered into the planning area. The 1989 through and external-internal travel indices were developed for the external stations using the following: the 1975 external origins and destinations surveys; changes in employment centers since 1975; expansion of the planning area; development trends; and the Fratar trip balancing program. This analysis estimated that there were 57,005 external-internal and 14,202 through trip crossings for an average weekday in the summer of 1989. The total external-internal trip crossings were treated as trip productions for the external stations (81-98) with the internal zones (1-97) attracting these trips based on the previously mentioned regression equation.

The gravity model was used to distribute the internal trips (HBW, OHB, & NHB) and the EXT-INT travel while the through travel was assigned directly to the highway network on a minimum path basis. The trip length distribution curves and travel time factors (Friction Factors) required by the gravity model are given in Table C-10. The synthetic method of developing travel patterns was checked by comparing the assignment of the travel on the existing highway system to actual ground counts at established locations. The results of the accuracy checks (mentioned earlier as screenline checks) were felt to be within acceptable limits for the purpose of this study.

2015 Travel

The year 2015 travel was developed using the same techniques employed in synthesizing the 1989 travel. The City Planner and the North Carolina DOT working in cooperation with other local and private interests developed the probable growth picture for the area. The City Planner projected the necessary housing and employment data for the year 2015 (see Tables C-6 & C-8). The generation rates for the year 2015 were developed using an equation that takes into consideration vehicle ownership trends, persons per household trends, and a vehicle usage factor. Table C-1 includes the development of the 2015 generation rates. The generation rates for commercially owned vehicles and trucks were held constant at 6.7 trips per vehicle, respectively. The 2015 commercially owned vehicles and trucks were estimated on a zonal basis using existing commercial autos as a percent of employment and expanding the employment to the future and keeping the percentages constant. The 2015 attraction factors were developed using the same regression equations that were developed and calibrated using 1989 data (see Table C-4) and the 2015 employment and housing data in Tables C-6 & C-8. The secondary NHB trips were developed using the 1989 ratio of secondary NHB trips per external-internal crossings by vehicles garaged outside the planning area times the estimated 2015 external-internal crossings by vehicles garaged outside the planning area. The 2015 secondary NHB trips were estimated at 55,900. The 2015 productions for HBW, HBO, NHB purposes were estimated using the same IDS program used in 1989. A growth rate analysis using historic travel trends and development potential was used to estimate traffic volumes at each external station for 2015 (see Table C-9). These volumes were converted to EXT-INT and through trips. Through trips were distributed using the Fratar trip end balancing program. The HBW, HBO, NHB, and EXT-INT trips were distributed using the same gravity model procedures employed in the base year.

APPENDIX C

TRAVEL MODEL INPUT VARIABLES, CALCULATIONS, AND TABLES

Table C-1 Dwelling Unit Based Auto Trip Generation Rates

YEAR	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	OVERALL AVERAGE
1989	12.0	10.0	8.0	6.0	4.0	7.12
INCREASE	0.7	0.7	0.7	0.7	0.7	----
2015	12.7	10.7	8.7	6.7	4.7	7.65

Calculation of the increase in trip generation rates

$$\text{COMPOSITE FACTOR} = \frac{\text{1989 PERSONS/VEHICLE}}{\text{2015 PERSONS/VEHICLE}} \times \text{USAGE FACTOR} \times \frac{\text{2015 PERSONS/DU}}{\text{1989 PERSONS/DU}}$$

$$\text{INCREASE FOR GENERATION RATES} = \text{AVERAGE 1989 TRIP RATE} \times \text{COMPOSITE FACTOR} - \text{AVERAGE 1989 TRIP RATE}$$

$$\text{COMPOSITE FACTOR} = \frac{1.40}{1.10} \times \frac{2.30}{2.60} \times 0.98 = 1.10$$

$$\text{INCREASE FOR GENERATION RATES} = (7.30 \times 1.10) - 7.30 = 0.73$$

Table C-2 Trip Percentages

TRIP PERCENTAGES BY PURPOSE
Internal of Total 88 %

HBW	25 %
OHB	48 %
NHB	27 %

Table C-3 Occupancy Rates

YEAR	PERSONS PER DWELLING UNIT	PERSONS PER VEHICLE
1989	2.60	1.40
2015	2.30	1.10

Development of Secondary Non Home Based Trips

$$\begin{array}{c} \text{Secondary} \\ \text{NHB Trips} \end{array} = \begin{array}{c} \text{Total Ext-Int} \\ \text{Trips} \end{array} - \begin{array}{c} \text{Ext-Int Trips Garaged} \\ \text{Inside Planning Area} \end{array} \times 0.60$$

1989 Secondary Trips = 0.60 (57,005 - 13,966) = 25,832

2015 Secondary Trips = 0.60 (120,483 - 27,327) = 55,893

Regression Equations for Attracting Trips:

The regrssion equation for trip attractions for the OHB, NHB and EXT-INT purposes took the form of:

$$\text{Trip Attractions} = aX_1 + bX_2 + cX_3 + dX_4 + eX_5 + fX_8$$

where;

X_1 = Industry Employment SIC # 1-49

X_2 = Retail Employment SIC # 50-54,56,57,59

X_3 = Special Retail Employment SIC # 55,58

X_4 = Office Employment SIC # 60-67,91-97

X_5 = Service Employment SIC # 70-76,78-89,99

X_8 = Large Shopping Areas

Table C-4 Regression Equation Coefficients

TRIP ATTRACTIONS	X1	X2	X3	X4	X5	X8
OHB	1.00	1.83	8.36	2.60	2.55	6.00
NHB	1.00	1.83	8.36	2.60	2.55	6.00
EXT-INT	1.00	1.83	8.36	2.60	2.55	6.00

The HBW Purpose is a special case where we take the trip attractions and set them equal to the total employment for each zone.

NOTE: SEE TABLES C-5, C-6, C-7, C-8 FOR BASE YEAR AND FUTURE YEAR EMPLOYMENT AND HOUSING DATA.

APPENDIX C
TABLE C-5
IDS HOUSING DATA (1989)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

	DWELLING UNITS CONDITION						SPECIAL VEHICLES	
ZONE	EXC	AAV	AVE	BA	POOR	TOTDU	TRUCK	CA
1	24	105	68	49	1	247	14	104
2	9	67	49	16	1	142	5	20
3	4	18	41	450	21	534	8	24
4	0	0	12	199	627	838	2	22
5	2	109	277	108	1	497	3	14
6	0	6	390	12	0	408	18	20
7	0	2	137	135	0	274	0	5
8	0	0	4	12	0	16	0	7
9	0	0	0	0	0	0	8	13
10	0	12	199	80	0	291	5	22
11	0	4	127	64	3	198	4	7
12	0	0	82	336	26	444	2	1
13	0	0	13	43	28	84	25	13
14	0	13	265	281	6	565	55	23
15	0	0	49	137	3	189	3	2
16	0	2	251	70	3	326	48	74
17	0	37	229	424	0	690	9	31
18	0	4	75	12	0	91	7	21
19	0	33	554	177	0	764	1	26
20	0	0	0	4	0	4	30	55
21	0	23	282	196	5	506	67	58
22	7	138	408	14	0	567	4	19
23	2	65	202	5	0	274	2	5
24	1	117	319	1	0	438	0	0
25	10	56	61	195	92	414	0	7
26	0	0	2	11	2	15	2	3
27	3	21	125	98	0	247	0	7
28	0	0	76	322	2	400	13	197
29	0	0	43	10	2	55	0	0
30	4	23	221	117	2	367	60	102
31	1	18	149	111	1	280	27	66
32	0	0	51	118	23	192	18	10
33	0	4	50	80	0	134	8	2
34	0	1	97	175	4	277	24	27
35	0	1	49	184	2	236	28	21
36	0	0	0	0	0	0	1	17
37	0	0	143	103	0	246	3	5
38	0	0	4	9	0	13	0	3
39	0	0	11	30	0	41	5	0
40	0	0	37	155	3	195	3	3
41	0	0	11	12	0	23	6	19
42	0	1	51	170	3	225	1	1

APPENDIX C
TABLE C-5 (CONTINUED)
IDS HOUSING DATA (1989)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

	DWELLING UNITS CONDITION						SPECIAL VEHICLES	
ZONE	EXC	AAV	AVE	BA	POOR	TOTDU	TRUCK	CA
43	0	0	76	30	0	106	0	1
44	0	1	69	160	1	231	16	7
45	0	9	93	88	1	191	1	0
46	0	2	47	44	0	93	103	15
47	0	0	0	0	0	0	0	0
48	0	1	3	12	10	26	3	1
49	0	0	1	23	5	29	1	0
50	1	3	28	108	0	140	1	3
51	0	1	9	17	10	37	0	0
52	0	0	6	0	0	6	0	0
53	0	0	5	9	8	22	0	0
54	0	0	19	14	1	34	0	0
55	1	3	26	24	14	68	4	10
56	0	0	0	0	0	0	0	0
57	0	0	16	6	3	25	2	2
58	0	0	4	13	3	20	0	0
59	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0
61	0	0	1	9	14	24	0	0
62	0	0	7	5	0	12	0	0
63	1	40	11	2	2	56	0	0
64	0	2	17	34	14	67	0	0
65	2	47	42	0	0	91	0	15
66	0	1	338	61	0	400	11	8
67	0	0	0	1	0	1	0	0
68	39	695	6	23	1	764	2	5
69	0	0	5	9	0	14	0	0
70	1	68	116	18	1	204	0	2
71	0	4	21	25	0	50	0	0
72	0	13	47	24	1	85	0	0
73	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0

APPENDIX C
TABLE C-5 (CONTINUED)
IDS HOUSING DATA (1989)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

	DWELLING UNITS CONDITION						SPECIAL VEHICLES	
ZONE	EXC	AAV	AVE	BA	POOR	TOTDU	TRUCK	CA
85	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
	------	------	------	------	------	-----	------	------
	112	1770	6227	5484	950	14543	663	1145

APPENDIX C
TABLE C-6
IDS HOUSING DATA (2015)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

	DWELLING UNITS CONDITION						SPECIAL VEHICLES	
ZONE	EXC	AAV	AVE	BA	POOR	TOTDU	TRUCK	CA
1	77	176	101	35	2	391	14	104
2	21	80	65	5	1	172	5	20
3	4	18	57	151	321	551	8	24
4	0	0	24	0	828	852	2	22
5	2	108	202	127	81	520	3	14
6	0	6	414	11	0	431	18	20
7	0	5	108	191	0	304	0	5
8	0	0	14	12	0	26	0	7
9	0	0	0	0	0	0	8	13
10	0	12	230	79	0	321	5	22
11	0	6	176	63	3	248	4	7
12	0	0	62	206	221	489	2	1
13	0	0	47	25	62	134	25	13
14	0	12	202	198	203	615	55	23
15	0	0	134	64	104	302	3	2
16	0	5	1119	42	35	1201	48	74
17	0	134	345	596	0	1075	9	31
18	0	21	201	19	0	241	7	21
19	0	42	527	275	0	844	1	26
20	0	0	164	5	0	169	30	55
21	0	27	371	196	13	607	67	58
22	20	223	541	23	0	807	4	19
23	9	140	299	22	0	470	2	5
24	1	210	455	2	0	668	0	0
25	10	129	92	143	290	664	0	7
26	0	0	222	15	3	240	2	3
27	3	168	577	62	75	885	0	7
28	0	0	216	155	252	623	13	197
29	0	70	173	20	2	265	0	0
30	9	51	413	237	212	922	60	102
31	6	33	129	151	121	440	27	66
32	2	7	160	71	169	409	18	10
33	0	4	93	81	0	178	8	2
34	0	1	152	185	4	342	24	27
35	0	1	74	86	105	266	28	21
36	0	0	27	0	0	27	1	17
37	0	0	71	134	68	273	3	5
38	0	0	26	7	0	33	0	3
39	0	0	38	38	0	76	5	0
40	0	0	67	55	103	225	3	3
41	0	0	43	14	0	57	6	19
42	0	1	126	0	170	297	1	1

APPENDIX C
TABLE C-6 (CONTINUED)
IDS HOUSING DATA (2015)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

	DWELLING UNITS CONDITION						SPECIAL VEHICLES	
ZONE	EXC	AAV	AVE	BA	POOR	TOTDU	TRUCK	CA
43	0	0	175	31	0	206	0	1
44	0	1	94	218	106	419	16	7
45	0	23	225	93	38	379	1	0
46	0	4	97	77	0	178	103	15
47	0	25	150	0	0	175	0	0
48	1	3	10	41	22	77	3	1
49	0	0	6	35	13	54	1	0
50	2	8	129	131	0	270	1	3
51	0	6	87	40	24	157	0	0
52	0	0	46	0	0	46	0	0
53	0	0	21	8	8	37	0	0
54	0	0	44	14	1	59	0	0
55	0	11	38	13	34	96	4	10
56	0	0	30	0	0	30	0	0
57	0	384	629	8	4	1025	2	2
58	0	510	488	15	3	1016	0	0
59	0	267	133	0	0	400	0	0
60	0	375	625	0	0	1000	0	0
61	0	0	61	9	14	84	0	0
62	0	0	28	4	0	32	0	0
63	1	114	46	1	2	164	0	0
64	0	92	69	2	39	202	0	0
65	2	200	187	0	0	389	0	15
66	0	1	242	61	0	304	11	8
67	0	0	50	1	0	51	0	0
68	43	1540	1	28	1	1613	2	5
69	0	95	56	8	0	159	0	0
70	1	289	380	33	1	704	0	2
71	0	14	61	25	0	100	0	0
72	0	97	352	35	1	485	0	0
73	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0

APPENDIX C
TABLE C-6 (CONTINUED)
IDS HOUSING DATA (2015)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

	DWELLING UNITS CONDITION						SPECIAL VEHICLES	
ZONE	EXC	AAV	AVE	BA	POOR	TOTDU	TRUCK	CA
85	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
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	214	5749	13117	4732	3759	27571	663	1145

APPENDIX C
TABLE C-7
IDS EMPLOYMENT DATA (1989)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

ZONE	INDUSTRY	RETAIL	HIGHWAY RETAIL	OFFICE	SERVICE	RETAIL CENTER	TOTAL EMPLOYMENT
1	157	326	49	721	481	0	1734
2	171	96	0	40	96	0	403
3	14	39	56	18	266	0	393
4	3	18	27	108	85	0	241
5	0	10	23	12	27	0	72
6	0	38	100	0	47	0	185
7	90	72	44	54	224	0	484
8	0	0	0	0	100	0	100
9	0	115	47	10	78	0	250
10	0	44	91	24	64	0	223
11	14	3	0	0	91	0	108
12	0	9	0	0	36	0	45
13	90	96	3	0	24	0	213
14	45	168	3	6	38	0	260
15	6	37	0	0	136	0	179
16	1268	37	0	156	77	0	1538
17	150	180	43	143	160	180	676
18	42	33	25	32	69	50	201
19	37	63	14	180	250	0	544
20	4	577	69	29	38	577	717
21	295	442	281	84	259	442	1361
22	6	126	20	5	27	0	184
23	0	2	0	6	47	0	55
24	0	0	0	0	28	0	28
25	0	0	2	0	13	0	15
26	3	2	7	3	22	0	37
27	3	3	2	0	12	0	20
28	101	17	2	5	19	0	144
29	0	0	0	0	0	0	0
30	149	38	73	0	294	0	554
31	178	63	88	14	58	0	401
32	19	29	0	0	76	0	124
33	5	0	0	0	2	0	7
34	69	75	22	11	122	0	299
35	42	13	7	0	17	0	79
36	0	0	0	0	1617	0	1617
37	9	13	22	4	54	0	102
38	0	5	10	8	2	0	25
39	0	0	3	0	2	0	5
40	46	0	0	0	10	0	56
41	60	15	3	20	0	0	98
42	0	5	0	0	0	0	5
43	0	2	0	0	4	0	6
44	27	39	25	5	48	0	144

APPENDIX C
TABLE C-7 (CONTINUED)
IDS EMPLOYMENT DATA (1989)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

ZONE	INDUSTRY	RETAIL	HIGHWAY RETAIL	OFFICE	SERVICE	RETAIL CENTER	TOTAL EMPLOYMENT
45	14	0	5	0	0	0	19
46	751	116	3	0	12	0	882
47	0	0	0	0	0	0	0
48	250	5	0	0	125	0	380
49	0	0	4	0	3	0	7
50	24	2	0	4	5	0	35
51	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0
54	8	2	0	0	3	0	13
55	27	0	14	0	0	0	41
56	0	0	0	0	0	0	0
57	453	0	0	12	0	0	465
58	0	0	0	0	2	0	2
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	0	0	0	340	130	340
66	159	102	7	53	157	0	478
67	0	0	0	0	0	0	0
68	16	210	8	16	41	0	291
69	0	0	0	0	0	0	0
70	0	0	0	0	8	0	8
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0

APPENDIX C
TABLE C-7 (CONTINUED)
IDS EMPLOYMENT DATA (1989)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

ZONE	INDUSTRY	RETAIL	HIGHWAY RETAIL	OFFICE	SERVICE	RETAIL CENTER	TOTAL EMPLOYMENT
89	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
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	4805	3287	1202	1783	5816	1379	16893

NOTES

TEMP only includes X1-X7

APPENDIX C

TABLE C-8

IDS EMPLOYMENT DATA (2015)

NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

ZONE	INDUSTRY	RETAIL	HIGHWAY RETAIL	OFFICE	SERVICE	RETAIL CENTER	TOTAL EMPLOYMENT
1	175	362	54	802	535	0	1928
2	214	124	0	66	124	0	528
3	16	44	63	20	300	0	443
4	4	21	30	111	88	0	254
5	0	17	30	20	35	0	102
6	0	51	135	0	64	0	250
7	98	78	48	59	242	0	525
8	0	0	0	0	100	0	100
9	0	138	56	12	94	0	300
10	0	49	101	29	74	0	253
11	19	8	0	0	101	0	128
12	0	19	0	0	46	0	65
13	114	120	6	0	30	0	270
14	53	200	4	8	45	0	310
15	7	43	0	0	160	0	210
16	1334	39	0	164	81	0	1618
17	192	135	61	184	204	135	776
18	72	61	51	60	106	93	350
19	41	69	15	199	276	0	600
20	4	610	73	30	40	610	757
21	309	462	294	88	271	462	1424
22	8	160	25	7	34	0	234
23	0	4	0	10	66	0	80
24	0	0	0	0	75	0	75
25	0	0	20	5	50	0	75
26	5	5	10	7	40	0	67
27	8	8	8	0	36	0	60
28	386	65	8	19	73	0	551
29	0	0	10	25	25	0	60
30	157	40	77	0	310	0	584
31	188	68	93	14	58	0	421
32	27	41	0	0	107	0	175
33	18	0	0	0	4	0	22
34	77	83	24	12	136	0	332
35	60	18	10	0	24	0	112
36	0	0	0	0	1637	0	1637
37	12	17	28	5	69	0	131
38	0	5	10	8	2	0	25
39	0	0	3	0	2	0	5
40	46	0	0	0	10	0	56
41	60	15	3	20	0	0	98
42	0	5	0	0	0	0	5
43	0	2	0	0	4	0	6
44	38	54	35	7	66	0	200

APPENDIX C
TABLE C-8 (CONTINUED)
IDS EMPLOYMENT DATA (2015)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

ZONE	INDUSTRY	RETAIL	HIGHWAY RETAIL	OFFICE	SERVICE	RETAIL CENTER	TOTAL EMPLOYMENT
45	66	0	23	0	0	0	89
46	790	123	5	0	14	0	932
47	150	0	0	0	0	0	150
48	250	15	5	5	125	0	400
49	0	0	4	0	3	0	7
50	38	3	0	5	9	0	55
51	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0
54	8	2	0	0	3	0	13
55	0	0	0	0	0	0	0
56	1500	25	20	350	105	0	2000
57	2000	40	20	522	150	0	2732
58	200	25	15	200	65	0	505
59	1500	25	20	350	105	0	2000
60	200	25	15	200	65	0	505
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	50	20	0	30	0	0	100
65	132	25	20	150	56	210	383
66	260	171	12	88	271	0	802
67	0	0	0	0	0	0	0
68	20	385	13	20	49	0	487
69	0	70	10	0	20	0	100
70	0	0	0	0	8	0	8
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0

APPENDIX C
TABLE C-8 (CONTINUED)
IDS EMPLOYMENT DATA (2015)
NEW BERN-BRIDGETON-TRENT WOODS-RIVER BEND PLANNING AREA

ZONE	INDUSTRY	RETAIL	HIGHWAY RETAIL	OFFICE	SERVICE	RETAIL CENTER	TOTAL EMPLOYMENT
88	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
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	10906	4194	1567	3911	6892	1510	27470

NOTES

TEMP only includes X1-X7

TABLE C-9
1989 AND 2015 THROUGH TRIP ANALYSIS

EXTERNAL STATION NUMBER	STATION LOCATION	1989 TRAFFIC			2015 TRAFFIC		
		TOTAL	EXT-INT	THRU	TOTAL	EXT-INT	THRU
81	US 17 NORTH	6000	3018	2982	12215	9520	2692
82	SR 1615 (ST. DELIGHTS CHURCH RD)	1916	1594	322	8600	7707	893
83	NC 55 EAST	8476	6538	1938	17300	13107	4193
84	SR 1600 (HALF MOON RD)	3400	2738	662	10700	8616	2084
85	SR 1113 (OLD CHERRY PT. RD)	3357	3095	262	5400	4759	641
86	US 70 EAST	26400	16698	9702	39000	18137	20863
87	SR 1111 (OLD AIRPORT RD)	331	207	124	1100	759	341
88	SR 1143 (LITTLE RD)	88	62	26	500	456	44
89	SR 1004 (BRICE'S CREEK RD)	540	458	82	1700	1471	229
90	SR 1144 (PERRYTOWN RD)	290	204	86	1300	1115	185
91	US 17 SOUTH	8900	5614	3286	17900	10808	7092
92	SR 1224 (TUSCARORA RD)	715	639	76	3000	2836	164
93	US 70 WEST	11000	4326	6674	18400	7197	11203
94	SR 1005 (OLD US 70)	1000	828	172	5000	4629	371
95	NC 55 NORTHWEST	2211	1949	262	3000	2659	341
96	NC 43	10185	8497	1688	9457	9200	257
97	SR 1433 (ANTIOCH RD)	600	540	60	3700	3548	152
98	US 17 NORTH BYPASS	--	--	--	22943	13978	8965

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TABLE C-10
FRICTION FACTORS AND TRAVEL CURVE DATA

	FRICTION FACTORS				HBW		OHB		NHB		EXT-INT	
TIME	HBW	OHB	NHB	E-I	TRIPS	PERCENT	TRIPS	PERCENT	TRIPS	PERCENT	TRIPS	PERCENT
1	1300	500	400	400	71	.27	119	.24	323	.60	0	.00
2	20900	25000	25000	5000	429	1.66	1532	3.08	6348	11.77	220	.39
3	25000	24800	19800	27500	859	3.32	2743	5.52	5667	10.50	2373	4.16
4	24800	25000	14600	22600	1792	6.92	5162	10.39	7337	13.60	657	1.15
5	24000	20800	9000	9300	2498	9.65	6542	13.16	10128	18.77	2220	3.89
6	22400	14300	6200	9900	2741	10.58	5437	10.94	6777	12.56	2504	4.39
7	39200	14500	5200	7500	4143	16.00	5664	11.40	5705	10.57	1361	2.39
8	21600	10600	2900	8000	2395	9.25	3575	7.19	2864	5.31	5069	8.89
9	20800	9500	1900	2400	2574	9.94	4145	8.34	1987	3.68	4637	8.13
10	12700	8900	3300	2200	1436	5.55	3967	7.98	2143	3.97	6307	11.06
11	11600	7900	3300	700	1325	5.12	3582	7.21	2751	5.10	7084	12.43
12	5500	4100	500	500	1025	3.96	3043	6.12	748	1.39	4869	8.54
13	8400	4100	400	500	1044	4.03	1958	3.94	341	.63	5648	9.91
14	7800	1700	300	250	808	3.12	867	1.74	182	.34	2330	4.09
15	4500	500	200	350	883	3.41	369	.74	227	.42	3501	6.14
16	4200	300	100	120	808	3.12	299	.60	127	.24	1034	1.81
17	3400	200	100	200	311	1.20	100	.20	38	.07	1677	2.94
18	3900	100	100	100	358	1.38	69	.14	33	.06	1268	2.22
19	1400	100	100	100	105	.41	56	.11	28	.05	1183	2.08
20	1100	100	100	100	107	.41	65	.13	40	.07	808	1.42
21	900	100	100	100	97	.37	72	.14	43	.08	578	1.01
22	600	100	100	100	37	.14	44	.09	21	.04	714	1.25
23	300	100	100	100	13	.05	65	.13	29	.05	421	.74
24	200	100	100	100	22	.08	81	.16	30	.06	192	.34
25	100	100	100	100	4	.02	48	.10	11	.02	87	.15
26	100	100	100	100	3	.01	19	.04	3	.01	89	.16
27	100	100	100	100	2	.01	19	.04	10	.02	103	.18
28	100	100	100	100	0	.00	9	.02	2	.00	7	.01
29	100	100	100	100	2	.01	13	.03	2	.00	17	.03
30	100	100	100	100	1	.00	8	.02	4	.01	6	.01
31	100	100	100	100	1	.00	7	.01	5	.01	32	.06
32	100	100	100	100	2	.01	24	.05	2	.00	9	.02